2016-1128, -1129, -1132

United States Court of Appeals for the Federal Circuit

INTELLECTUAL VENTURES I LLC, INTELLECTUAL VENTURES II LLC,

Plaintiffs – Appellants,

ν.

ERIE INDEMNITY COMPANY, ERIE INSURANCE EXCHANGE,
ERIE INSURANCE PROPERTY & CASUALTY COMPANY,
ERIE INSURANCE COMPANY, FLAGSHIP CITY INSURANCE COMPANY,
ERIE FAMILY LIFE INSURANCE COMPANY, HIGHMARK, INC.,
HM INSURANCE GROUP, INC., HM LIFE INSURANCE COMPANY,
HIGHMARK CASUALTY INSURANCE COMPANY, HM CASUALTY
INSURANCE COMPANY, OLD REPUBLIC GENERAL INSURANCE GROUP,
INC., OLD REPUBLIC INSURANCE COMPANY,
OLD REPUBLIC TITLE INSURANCE GROUP, INC.,
OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY,

Defendants-Appellees.

Appeals from the United States District Court for the Western District of Pennsylvania in Nos. 1:14-cv-00220-MRH, 2:14-cv-01130-MRH, and 2:14-cv-01131-MRH, Judge Mark R. Hornak.

BRIEF FOR APPELLANTS

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UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

Intellectual Ventures I LLC v. Erie Indemnity Company

No. 2016-1128, -1129, -1132

CERTIFICATE OF INTEREST

Counsel for Appellant, Christian J Hurt, certifies the following:

1. The full name of every party or amicus represented by me is:

Intellectual Ventures I LLC Intellectual Ventures II LLC

2. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by me is:

None.

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by me are:

None.

4. The names of all law firms and partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court are:

Derek Gilliland, Ed Chin (former), Kirk Voss, Christian J. Hurt, Winn Cutler, Ross Leonoudakis, Andrew Wright (former), Nix Patterson & Roach L.L.P.; Henry M. Sneath, Robert L. Wagner, Picadio Sneath Miller & Norton, P.C.

DATED: January 27, 2016. Respectfully submitted,

/s/ Christian Hurt

CHRISTIAN HURT

Attorney for Plaintiff-Appellant

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STATEMENT OF RELATED CASES

The Patents-in-Suit—U.S. Patent Nos. 6,519,581 ("the '581 Patent"), 6,510,434 ("the '434 Patent"), and 6,546,002 ("the '002 Patent") are involved in other matters. This appeal has been consolidated with two other appeals, *Intellectual Ventures I LLC v. Highmark, Inc.*, Case No. 16-1129 and *Intellectual Ventures I LLC v. Old Republic*, Case No. 16-1132, and has been designated as the lead appeal. This appeal has also been deemed a companion appeal with *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, Case No. 16-1077, an appeal that raises whether the '002 Patent claims patent-eligible subject matter. The '002 Patent is also asserted in in *Intellectual Ventures I LLC v. Citigroup, Inc.*, No. 14-CV-4638-AKH (S.D.N.Y.).

The Patents-in-Suit are also at-issue in petitions for review and instituted proceedings before the Patent Trial & Appeal Board ("PTAB"). The '581 Patent is subject to four pending petitions for *Inter Partes* Review: IPR2015-01542, IPR2015-01543, IPR2015-01956, and IPR2015-01957. The '434 Patent is involved in one instituted *Inter Partes* Review proceeding, IPR2015-01481, and two pending petitions for *Inter Partes* Review, IPR2016-00019 and IPR2016-00020. The '002 Patent is subject to two instituted proceedings for *Inter Partes* Review: IPR2015-00089 and IPR2015-00092. The '002 Patent is also involved in

pending petitions for *Inter Partes* Review and Covered Business Method Review: IPR2015-01992 and CBM2015-00184.

JURISDICTIONAL STATEMENT

This consolidated appeal arises from the District Court's entry of a final order of dismissal in *Intellectual Ventures I LLC v. Highmark, Inc.*, Case No. 2:14-CV-01131-MRH (W.D. Pa.) and *Intellectual Ventures I LLC v. Old Republic Gen. Ins. Grp., Inc.*, Case No. 2:14-CV-01130-MRH (W.D. Pa.), and the District Court's entry of a final judgment under Rule 54(b) in *Intellectual Ventures I LLC v. Erie Indemnity Co.*, Case No. 1:14-CV-00220-MRH (W.D. Pa.). This Court thus has jurisdiction under 28 U.S.C. § 1295(a)(1).

STATEMENT OF THE ISSUES

Intellectual Ventures I LLC and Intellectual Ventures II LLC (collectively, "IV") present four issues in the appeal: an ownership issue and three patent-eligible subject matter issues. The first issue is whether the District Court correctly concluded that IV does not own the '581 Patent, despite holding an assignment of all rights in and to the parent patent of the '581 Patent (which issued as a pure continuation) and the goodwill of the business symbolized by that patent. The remaining three issues address whether the District Court rightly determined, at the Rule 12(b)(6) stage, that every claim in three patents directed to computer software solutions to technological problems failed to claim patent-eligible subject matter.

STATEMENT OF THE CASE

This appeal challenges the District Court's dismissal of IV's Complaints, in particular the Court's conclusions that (1) IV lacks of standing to assert infringement of the '581 Patent; (2) the '581 Patent fails to claim patent-eligible subject matter; (3) the '434 Patent fails to claim patent-eligible subject matter; and (4) the '002 Patent fails to claim patent-eligible subject matter. J.A. 1–77.

I. The Acquisition of the '581 Patent

IV was founded in 2000 on the fundamental premise that inventions are valuable. J.A. 242. Since its founding, IV has built on this premise by working to ensure that a market for invention continues to thrive. *Id.* As part of that effort, IV acquired the Patents-in-Suit, including the '581 Patent.

IV claims title to the '581 Patent through a series of transactions. The ownership challenge in this appeal is limited to one transaction: the 2002 assignment between AllAdvantage.com and Alset.

A. The Transactions Leading Up to the AllAdvantage.com-Alset Assignment

The '581 Patent issued from a continuation patent application of U.S. Patent 6,236,983 ("the '983 Patent"). J.A. 79, '581 Patent, at (63). The inventors filed the application that issued as the '983 Patent on January 31, 1998, *id.*, and, shortly

thereafter, the inventors assigned to Aveo Inc. ("Aveo") their rights to the '983 Patent application as well as all continuation applications, J.A. 811.

On April 10, 2001, Aveo sold "all of the property" and any proceeds it owned or had an interest in, including its patents, to Sherwood Partners, Inc. ("Sherwood Partners"). J.A. 830–31. Paul Hurley, the founder and CEO of Aveo, negotiated that assignment on Aveo's behalf. J.A. 935. He testified that the intent of the transaction was to transfer all of Aveo's assets to Sherwood Partners. *Id*.

After the Sherwood Partners transaction closed, the inventors filed the '581 Patent application on April 27, 2001. J.A. 79, '581 Patent, at (22). Although their previous assignment to Aveo explicitly transferred any rights the inventors had in continuation applications (rights which had since passed to Sherwood Partners), J.A. 811, the inventors executed an assignment purporting to assign their rights in the '581 Patent application to Aveo, J.A. 817–18. Aveo, through My. Hurley, later clarified in a *nunc pro tunc* assignment that the '581 Patent application had indeed been assigned from Aveo to Sherwood Partners via the April 10, 2001 assignment. J.A. 828 (listing U.S. Patent Application Serial No. 09/844,858 as "hav[ing] been assigned" to Sherwood Partners on April 10, 2001).

Sherwood Partners held Aveo's assets for about three months. In July 2001, Sherwood Partners transferred, among other assets, the '983 Patent and "any

continuation[s]" to AllAdvantage.com. J.A. 837–54. Less than six months later, AllAdvantage.com entered into an assignment with Alset Inc. ("Alset").

B. The AllAdvantage.com-Alset Assignment

The same Mr. Hurley who founded Aveo also co-founded and served as CEO of Alset. J.A. 935. Mr. Hurley negotiated the AllAdvantage.com-Alset assignment on behalf of Alset. *Id.* He testified that the intent of the transaction was to transfer to Alset the assets that Aveo had sold less than a year earlier to Sherwood Partners (which AllAdvantage.com had acquired). *Id.* It undisputed that those assets included the '581 Patent application and that AllAdvantage.com had acquired title to the application. The issue in this appeal is whether the AllAdvantage.com-Alset assignment transferred the '581 Patent application to Alset or AllAdvantage.com retained ownership of the application.

The AllAdvantage.com-Alset assignment is a short document with straightforward language. It first recites a list of patents and applications owned by AllAdvantage.com. J.A. 805–06. That list includes the '983 Patent but it does not include the '581 Patent application. *Id.* After that list, the assignment contains a broad assignment of rights from AllAdvantage.com to Alset, including all the rights in and to the listed patents and the goodwill of the business symbolized by those patents and applications:

NOW THEREFORE, for good and valuable consideration, receipt of which is hereby acknowledged, Assignor, does hereby assign unto Assignee, all right, including common law rights, title, and interest in the United States of America, Canada, the European Union, and all other countries and jurisdictions in the world in and to said patents together with the goodwill of the business symbolized by said patents and applications and registrations thereof.

J.A. 806 (emphasis added).

C. The Parties' Conduct After Execution of the AllAdvantage.com-Alset Assignment

Within months of the transaction, Alset assumed the prosecution of the '581 Patent application before the U.S. Patent & Trademark Office ("Patent Office"). *See* J.A. 969–70. Alset revoked the previous powers of attorney and appointed its counsel, including Lisa Benado, to prosecute the application. *Id.* AllAdvantage.com had no role in the prosecution of the '581 Patent application.

Ms. Benado performed a number of tasks indicating that Alset owned the '581 Patent application. She filed the AllAdvantage.com-Alset assignment in the file history of the '581 Patent application and represented to the Patent Office that it conveyed the rights in the application from AllAdvantage.com to Alset. J.A. 803–06; J.A. 947–48. Ms. Benado testified that, as part of that task, she reviewed the assignment and concluded that it transferred the '581 Patent to Alset. J.A. 948; J.A. 950–51; J.A. 952–56. Ms. Benado also filed a terminal disclaimer that limited

the term of the '581 Patent claims to those of the '983 Patent and representing that Alset owned "the entire interest in" the '581 Patent application. J.A. 987.

The '581 Patent issued in early 2003 and listed Alset as the assignee. J.A. 79. Alset paid that issuance fee, J.A. 990, and Alset's successors-in-interest have since paid the maintenance fees for the '581 Patent.

Alset assigned the '581 Patent to an IV entity in 2005. J.A. 863–64. In the assignment, Alset warranted that it was "the sole owner, assignee and holder of record title" of the '581 Patent. J.A. 863. That assignment was subsequently recorded at the Patent Office. J.A. 862. At no point after the AllAdvantage.com-Alset assignment has AllAdvantage.com or its successors-in-interest asserted ownership over the '581 Patent.

II. The Technology of the Patents-in-Suit

The Patents-in-Suit disclose and claim technical computer solutions to computer-based problems. They are not directed to business methods, financial products, mathematical equations, or creating or maintaining economic or legal relationships. Each Patent is briefly introduced below.

A. The '581 Patent

The '581 Patent generally relates to diagnostic software distributed over a computer network. The Patent claims priority to an application filed in 1998, and network diagnostic software from that time period had two main problems. First, it

was not customizable—a programmer would need to modify the application source code or the built-in diagnostic routine to change its data collection routine. J.A. 86, '581 Patent, col. 1 ll. 25–41. It also often required the user to initiate the software and did not passively operate in the background. *Id.* col. 1 ll. 42–52.

The '581 Patent solves these two problems (among others). It provides network-based diagnostic software that can run in the background and is customizable. J.A. 86, '581 Patent, col. 1 l. 62–col. 2 l. 29. The Patent achieves that solution by dividing the software into three separate pieces—discovery agents, discovery rules, and a discovery engine—that are distributed over a client-server network. *See* J.A. 80, '581 Patent, Fig. 1. By separating the aspects of the diagnostic software, the technology is highly customizable and may run in the background of the client computer.

Claim 11, at issue in this appeal, is drawn to the client-side computer implementation of the diagnostic software:

11. In a computer system, [a] method of collecting information comprising:

receiving a discovery rule across a communication link from a sender,

applying the discovery rule to data about the computer system or a user to generate information, and

wherein the data is collected by a discovery agent located in the computer system when the discovery agent is activated and without requiring action by the user; and

communicating the information across the communication link back to the sender of the discovery rule.

J.A. 91, '581 Patent, claim 11. In total, the '581 Patent contains five sets of independent claims and forty-seven claims in total.

B. The '434 Patent

The '434 Patent also relates to computer technology. More specifically, the Patent is directed to improved computer database technology using a novel database structure and search process. The Patent, which was developed by BellSouth, is entitled "System and method for retrieving information from a database using an index of XML tags and metafiles." J.A. 121, '434 Patent, at (54), (73).

In the late 1990s, the amount of computer data stored in database systems was increasing at a quick pace. *See* J.A. 135, '434 Patent, col. 1 ll. 30–31. That pace exceeded the capability of existing database search technologies, which did not always return the information requested in the search and often returned too much information. *Id.*, col. 1 ll. 30–57.

Multiple database systems, which were starting to become implemented, had additional problems. Data stored in one database could be repeated in another database and the system may require multiple searches across the databases to

ensure complete search results. J.A. 135, '434 Patent, col. 2 ll. 6–24. Those problems affected the speed and performance of the database system.

The '434 Patent meets those challenged by "providing a method for locating information stored in a database using an index that includes tags and metafiles to locate the desired information." J.A. 135, col. 2 ll. 36–39. The patented technology, carried out by software modules, constructs an index and a database by utilizing various tags and metafiles linked together. E.g., J.A. 123, Fig. 1A; J.A. 124, Fig. 1B; J.A. 129, '434 Patent, Fig. 5; J.A. 140, '434 Patent, col. 11 l. 6–col. 12 l. 34. The bulk of the disclosure is directed to XML-based databases, which is one particular database.

Claim 1, at issue in this appeal, is drawn to a method of creating the inventive computer database:

1. A method for creating a database and an index to search the database, comprising the steps of:

creating the index by defining a plurality of XML tags including domain tags and category tags;

creating a first metafile that corresponds to a first domain tag;

and creating the database by providing a plurality of records, each record having an XML index component.

J.A. 91, '581 Patent, claim 11. Claim 19, also at issue, provides a method for searching the inventive database:

19. A method for searching a database of information, comprising the steps of:

receiving a request for information from a client, the request having a first term; identifying a first XML tag that is associated with the first term;

determining whether a first metafile corresponds to the first XML tag;

if the first metafile corresponds to the first XML tag, then transmitting the first XML tag, the first metafile and query code to the client;

once the client conducts a query by executing the query code using the first XML tag and the first metafile, then receiving query results including a first set of XML tags from the client;

combining the first set of XML tags into a key;

using the key to search the database to locate records including the first set of XML tags; and

delivering the records including the first set of XML tags to the client.

J.A. 143, '581 Patent, claim 19. In total, the '434 Patent contains twenty-eight claims, seven of which are independent claims. J.A. 142–42.

C. The '002 Patent

The '002 Patent "relates generally to the field of computer networks." J.A. 110, '002 Patent, col. 1 ll. 7–12. Prior to the filing of the '002 Patent in 1999, computer systems were unable to provide a user with mobile access to the user's

resources on a remote computer, such as software programs, applications, and files. J.A. 111, '002 Patent, col. 3 ll. 57–60. The Patent solves that problem by providing "a mobile interface agent that can be used to dynamically access resources stored either locally in the computing device or across a network." *Id*.

The '002 Patent is also issue in the companion *Capital One* appeal, and IV adopts its discussion of the '002 Patent in that case rather than repeat it. Corrected Opening Br. of Appellants (Docket No. 27), at 12–15, *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, Case No. 16-1077 (Fed. Cir. Jan. 14, 2016) ("*Capital One* Br.").

For the Court's reference, below are two claims at issue in this appeal.

Claim 40 is directed to a network computer system that utilizes a mobile interface:

40. A system for storing and accessing user specific resources and information, the system comprising:

a network for accessing the user specific resources and information stored in a network server;

and a local device communicating with the network and having a local memory and a mobile interface, wherein the local memory also includes user specific resources and information, and the mobile interface includes pointers corresponding to the user specific resources and information that are stored either on the local device or the network server, wherein the pointers provide links to access the corresponding user specific resources and information.

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J.A. 119, '002 Patent, claim 40. Claim 25 is drawn to the structure of a mobile interface:

25. A mobile interface used for accessing user specific resources and information stored either on a local computer device or a network server, the mobile interface comprising:

means for interfacing any local computer device with the network server;

means for presenting a plurality of pointers on any local device corresponding to the user specific resources and information to a user; and

means for accessing the user specific resources and information using the plurality of pointers.

J.A. 143, '002 Patent, claim 25. The '002 Patent contains six sets of independent claims and forty-nine claims in total.

III. The Proceedings Before the District Court

IV approached Erie and Old Republic (collectively, "the Defendants")¹ and made several good-faith attempts to negotiate the terms of a license with them.

J.A. 245 (referencing letter to Erie Defendants); J.A. 257 (referencing letter to Old Republic Defendants). Neither responded, which forced IV to file suit. *Id*.

¹ IV also filed suit against Highmark, but the parties have now resolved their disputes.

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The Defendants did not answer the complaints. Instead, they filed a series of motions to dismiss, including motions based on standing to assert the '581 Patent and Section 101. Other than limited discovery relating to IV's ownership of the '581 Patent, the parties did not engage in any discovery.

The District Court granted the Defendants' motions. J.A. 1–77. The Court first determined that IV did not own the '581 Patent and therefore lacked standing to assert it. J.A. 12–24. The Court concluded that the AllAdvantage.com-Alset assignment did not convey title to the '581 Patent application because the assignment did not expressly list that application. J.A. 12–14. Even though the '581 Patent issued as a pure continuation application of the '983 Patent, the Court concluded that the language assigning the rights in and to the '983 Patent did not transfer the '581 Patent application. J.A. 14–17. The Court likewise determined that the assignment of goodwill did not assign the '581 Patent application. J.A. 18–21. Lastly, the Court held that the extrinsic evidence did not detract from its construction of the assignment. J.A. 21–24.

The District Court also held that the Patents-in-Suit all claimed abstract ideas and thus were not eligible for a patent. J.A. 48–76. It first held that each Patent was directed to an abstract idea. J.A. 51; J.A. 63; J.A. 72. The Court concluded that the Patents related to "longstanding, well-known methods of organizing human activity," J.A. 51 (the '581 Patent), could be analogized to the

brick-and-mortar activity of "searching for a library book using an index and its various categories," J.A. 68 (the '434 Patent), and could be analogized to "calling a person from one location in order to obtain information located in another location," J.A. 72–73 (the '002 Patent). The Court then found, at the motion to dismiss stage, that each Patent could be implemented using conventional computer technology and lacked inventive concepts. J.A. 52–61; J.A. 65–70; J.A. 73–76. As a result, the Court held that the Patents failed to claim patent-eligible subject matter and dismissed the case under Rule 12(b)(6).

This appeal followed.

SUMMARY OF THE ARGUMENT

The District Court erred in its standing and patent-eligibility decisions. IV owns the '581 Patent, and the AllAdvantage.com-Alset assignment does not create a hole in the chain-of-title. The intent of that assignment was to provide Mr. Hurley's new company (Alset) with the assets of his old company (Aveo), which now were in the hands of AllAdvantage.com. There is no evidence that AllAdvantage.com—who presumably had other lines of business—intended to retain the '581 Patent application. Indeed, after the transaction, Alset assumed the prosecution of the '581 Patent application, represented to the Patent Office that it owned the application, and then warranted to IV that it owned the '581 Patent.

The language of the assignment transfers to Alset the '581 Patent application. While it does not expressly list the '581 Patent application, the assignment undisputedly transferred the parent patent (the '983 Patent) and broadly transferred to Alset all of the rights "in and to said patent[]" and "the goodwill of the business symbolized by said patent[] and applications and registrations thereof." J.A. 806. The rights to the '581 Patent application fall into both buckets—as a pure continuation application, it was a right in and to the '983 Patent and it formed the basis of the goodwill of the '983 Patent and its applications. There is no language excluding the '581 Patent application, and, in the absence of that type of intent, rights to continuation patents travel with the parent patent.

The District Court's patent-eligibility decision was also in error. The Court erroneously concluded, at the motion to dismiss stage, that all of the 124 claims of the Patents-in-Suit failed to claim patent-eligible subject matter. The substantive test for patent eligibility and the procedural framework for invalidity-based Rule 12(b)(6) motions counsel against invalidating a patent wholesale at the pleadings stage—unless it is clear that each claim is not patent-eligible and no amount of discovery, claim construction, or expert testimony would change that result. But, if the issue is a close one, both *Alice*'s instruction to tread carefully and the procedural hurdles to invalidate a patent at the pleadings stage require the suit to proceed rather than strip the patentee of its property rights.

The Patents here are not directed to abstract ideas—they are directed to network diagnostic software, improved database search technology, and mobile computing technology. The Court improperly recast the Patents as computer-free abstract ideas, severing them from their computer technology roots and ignoring that they provided computer-based solutions to computer-based problems. Then, concluding that the claimed software-based systems could run on any type of computer system (as virtually all software can), the Court incorrectly found that the Patents lacked sufficient limitations to transform them into patent-eligible inventions. And it did so without any supporting evidence.

The Court reached those conclusions on the pleadings, without the benefit of any claim construction evidence or expert testimony bearing on the nature of the Patents-in-Suit. That record would have further illuminated what the Patents on their face show—that these computer-heavy patents claim patent-eligible subject matter. At the very least, the eligibility issues are close ones warranting a more complete record. For these reasons, and the ones detailed below, IV respectfully requests that this Court reverse the District Court's dismissal of its Complaints.

ARGUMENT

I. Standard of Review

This Court reviews without deference a court's dismissal for lack of standing under Rule 12(b)(1). *Abbott Point of Care Inc. v. Epocal, Inc.*, 666 F.3d 1299,

1302 (Fed. Cir. 2012); *In re Schering Plough Corp.*, 678 F.3d 235, 243 (3d Cir. 2012). Similarly, applying the law of the regional circuit (here, the Third), this Court reviews de novo a dismissal under Rule 12(b)(6). *Content Extraction & Trans. LLC v. Wells Fargo Bank, Nat'l Assn.*, 776 F.3d 1343, 1346 (Fed. Cir. 2014) (applying Third Circuit law).

This Court also reviews without deference the substantive issues on appeal. Regarding standing, the parties agree that California law applies to the interpretation of the AllAdvantage.com-Alset assignment, and under California law, that interpretation is a legal question reviewed de novo. *Epistar Corp. v. Int'l Trade Comm'n*, 566 F.3d 1321, 1332 (Fed. Cir. 2009) (applying California contract law). The Court also reviews the District Court's determination of patent eligibility under § 101 de novo. *Content Extraction*, 776 F.3d at 1346.

II. Intellectual Ventures Owns the '581 Patent

A. The Parties Intended to Convey to Alset the Rights in the '581 Patent

The intent of the AllAdvantage.com-Alset transaction was to transfer to Alset all of the Aveo-originating assets owned by AllAdvantage.com—which includes the '581 Patent application. J.A. 935. That intent is apparent from the face of the assignment.

The assignment lists the '983 Patent (among others) and then transfers "all right ... in and to said patent[] together with the goodwill of the business

symbolized by said patent[] and applications ... thereof." JA. 806. At two places, that conveyance shows an intent to include the '581 Patent application, a pure continuation of the '983 Patent.

First, the rights "in and to" the '983 Patent include the rights to the '581 Patent application. The rights in and to a patent necessarily include the rights to continuation applications—those applications are bound to the "same inventive subject matter" disclosed in the parent patent and their claims are limited by that subject matter. *See Intel Corp. v. Negotiated Data Solutions, Inc.*, 703 F.3d 1360, 1366 (Fed. Cir. 2012); *see also Hendrie v. Sayles*, 98 U.S. 546, 553–54 (1879) (explaining that a conveyance of an invention "secured . . . by letters-patent" carries the "entire invention and all alterations and improvements and all patents whatsoever, issued and extensions alike, to the extent of the territory specified in the instrument"). The opposite outcome would divide legal title to the same inventive subject matter and deprive Alset of its full rights "in and to" the '983 Patent.

The second evidence of intent to convey the '581 Patent application is the transfer of goodwill. The assignment conveys the rights in and to the listed patents *and* the "goodwill of the business symbolized by *said patents and applications* and registrations *thereof*." J.A. 806 (emphases added). That transferred goodwill

includes the right to commercialize or license the patented inventions through the expiration of the '983 Patent as part of the patent monopoly:

By the force of the patent laws not only is the invention of a patent dedicated to the public upon its expiration, but the public thereby becomes entitled to share in the good will which the patentee has built up in the patented article or product through the enjoyment of his patent monopoly.

Scott Paper Co. v. Marcalus Mfg. Co., 326 U.S. 249, 256 (1945) (emphasis added). Excluding the '581 Patent from the scope of the assignment would devalue that goodwill. If AllAdvantage.com retained its rights to the '581 Patent, Alset could not commercialize the inventions of the '983 Patent without risking an infringement suit from AllAdvantage.com. And any sale or license of the assets by Alset would likewise carry forward that risk.

That risk flows from the '581 Patent's status as a continuation of the '983 Patent—they both cover the same inventive subject matter disclosed in the '983 Patent. Indeed, the claims of the '581 and '983 Patents are so similar that Alset filed a terminal disclaimer to limit the term of the '581 Patent to that of the '983 Patent. J.A. 987–88; *Merck & Co. v. Hi-Tech Pharm. Co.*, 482 F.3d 1317, 1323 (Fed. Cir. 2007) (explaining that the purpose of a terminal disclaimer is "to prevent extension of patent term for subject matter that would have been obvious over an earlier filed patent"). Due to the legal risk caused by dividing title to common inventive subject matter, Alset would not receive the goodwill relating to the

"enjoyment of [the] patent monopoly" in the '983 Patent unless it received the rights to the '581 Patent as well. *Scott Paper*, 326 U.S. at 256.

The District Court came to a contrary and incorrect reading of the assignment. It concluded that the relationship between the '581 Patent and the '983 did not matter—"[c]ontinuation or not, the Court cannot assume that a patent application meant to be conveyed would not be explicitly listed" within the assignment. J.A. 13. As to the transfer of goodwill, the court concluded that patent rights are not goodwill. J.A. 18–20. Both conclusions were in error.

The continuation relationship between the '983 and '581 Patents is important. The assignment transfers not just title to the '983 Patent, but all rights "in and to" the Patent. That broad grant encompasses the rights in the inventive subject matter in the '983 Patent, from which the '581 Patent claims are based. Thus, the rights to the '581 Patent application transferred as a right in and to the parent application.

The District Court also improperly limited the transfer of goodwill under the assignment as excluding patent rights. Contrary to the Court's bright-line holding, courts have concluded that "[g]oodwill sometimes is used to describe the aggregate of all of the intangibles of a business, *including such items as patents*, trademarks, leases, contracts, and franchises." *Richard S. Miller & Sons, Inc. v. United States*, 537 F.2d 446, 450 (Ct. Cl. 1976) (emphasis added).

Moreover, the assignment here does not merely transfer "goodwill" in the abstract; it transfers the "goodwill of the business symbolized by" the '983 Patent and its applications. If the clause excludes patent rights, then what does it include? Tellingly, the District Court did not identify a single goodwill-related asset or right symbolized by the '983 Patent or its application that Alset received via the assignment.

The goodwill transferred in the assignment includes the rights to enjoy the patent monopoly by commercializing or licensing the invention. The only way Alset can enjoy those rights vis-a-vis AllAdvantage.com for the '983 Patent is if it possessed the rights to the '581 Patent as well.

B. The Assignment Lacks Any Language Excluding the '581 Patent, Which Strongly Weighs in Favor of Finding That the Assignment Transferred the Patent to Alset

It is undisputed that the assignment lacks language excluding the '581 Patent application. That fact has legal consequence because the '581 Patent is a continuation of the '983 Patent.

As detailed above, pure continuation patents have a special relationship to the patents from which they claim priority. A continuation patent is "based on the same disclosure" as the parent patent and "by definition ... can claim no new invention not already supported" in that parent disclosure. *Gen. Protecht Grp., Inc. v. Leviton Mfg. Co.*, 651 F.3d 1355, 1361 (Fed. Cir. 2010).

For that reason, the Patent Office's Manual of Patent Examining Procedure ("MPEP") explains that an assignment of a parent patent *is effective as applied to a continuation patent* because such an assignment "gives the assignee rights to the subject matter common to both applications":

In the case of a division or continuation application, a prior assignment recorded against the original application is applied (effective) to the division or continuation application because the assignment recorded against the original application gives the assignee rights to the subject matter common to both applications[.]

MPEP § 306 (emphasis added). Because that rule is recited in the Patent Office's MPEP, many patent practitioners rely upon it as a default rule when crafting patent assignments.

Independent of the MPEP, this Court has reached similar conclusions in the licensing context. For example, this Court has held that a license to a parent patent covering specific products implicitly includes a license to any continuation patents "absent a clear indication of mutual intent to the contrary." *Gen. Protecht*, 651 F.3d at 1361. As with MPEP § 306, a large part of that holding rests on the inventive relationship between continuation applications and their parent patents. *See Endo Pharms., Inc. v. Actavis, Inc.*, 746 F.3d 1371, 1378 (Fed. Cir. 2014) (emphasizing that *General Protecht* applied to "continuations of the licensed patents" and declining to extend it to patents that "lack [] a continuation relationship" with the licensed patent) (emphasis in original). As even the District

Court appeared to recognize, applying the approach taken in MPEP § 306 and General Protecht requires reversal here. See J.A. 13.

The District Court nonetheless declined to follow these rules. J.A. 14–17. Relying on *Regents of University of New Mexico v. Knight*, the Court concluded that the MPEP "is not a statement of law" and that MPEP § 306 "does not alter the legal ownership rights in patent applications and issued patents." J.A. 15 (quoting *Knight*, 321 F.3d 1111, 1121 (Fed. Cir. 2003)). But *Knight* does not govern this case because it involved continuation-in-part applications and the employment agreement at issue there trumped the general continuation-in-part rule delineated in MPEP § 306.

The MPEP recognizes that continuation-in-part applications are different from continuation applications. With regard to the former, MPEP § 306 provides that "a prior assignment of the original application *is not applied (effective)* to the ... *continuation-in-part* application" because a prior assignment of the parent patent "gives the assignee *rights to only the subject matter common to both applications*." MPEP § 306 (emphases added).

² The District Court also relied on a non-precedential decision from this Court, *Bellehumeur v. Bonnett*, 127 F. App'x 480, 484–85 (Fed. Cir. 2005) (non-precedential). Aside from lacking the force of precedent, the *Bellehumeur* case did not address the applicability of MPEP § 306 (which the party later conceded did not apply) and issued five years before *General Protecht*.

Moreover, while that may be a correct general rule for assignments that list the parent patent but do not encompass continuation-in-part applications, the employment agreement at issue in *Knight expressly* trumped that general law. It conveyed all rights to any inventions made by the inventor regardless of the type of patent application. *Knight*, 321 F.3d at 1120; *see also Gen. Protecht*, 651 F.3d at 1361 ("It is well settled that parties are free to contract around an interpretative presumption that does not reflect their intentions."). The *Knight* Court thus correctly concluded that MPEP § 306 could not alter the legal ownership rights expressly transferred via the employment agreement—a point which has no application here.

Indeed, this case is essentially *Knight*'s opposite. Here, the assignment listed the rights in and to '983 Patent and the business goodwill associated with that patent and its application. It did not expressly list the '581 Patent application, but did not exclude it either. Thus, the general rule recited in MPEP § 306, consistent with the reasoning in *General Protecht*, fully applies and confirms exactly what the assignment indicates on its face. Nothing in *Knight* requires a different result.

C. The Extrinsic Evidence Confirms That the '581 Patent Was Assigned to Alset

If the plain language of the assignment left room for doubt, the extrinsic evidence shows that the parties intended to assign the '581 Patent application to Alset. Under California law, the Court first receives extrinsic evidence to determine if the language of the contract is reasonably susceptible to the interpretation urged by a party, *i.e.*, if the contract is ambiguous. *Wolf v. Superior Court*, 8 Cal. Rptr. 3d 649, 656 (Cal. Ct. App. 2004), *as modified on denial of reh'g* (Feb. 19, 2004). If so, the extrinsic evidence is admitted to aid in interpreting the contract. *Id.*

The extrinsic evidence here shows that the assignment is at least reasonably susceptible to the construction proffered by IV:

- Paul Hurley, who negotiated the transaction on behalf of Alset, testified that the intent of the transaction was to vest in Alset title to all of the assets that Aveo had transferred to Sherwood Partners (who then transferred them to AllAdvantage.com). J.A. 935. The transactions occurred over a one-year period, and there was no indication that any party intended to break the chain of title of any of Aveo's patents or applications.
- Shortly after the AllAdvantage.com-Alset transaction closed, Mr. Hurley revoked the previous powers of attorneys and appointed new counsel to prosecute the '581 Patent application on behalf of Alset (among others, he appointed patent attorney Lisa Benado). J.A. 969–70. Alset's counsel would prosecute the application through issuance. *See* J.A. 990.
- Ms. Benado then filed the AllAdvantage.com-Alset assignment in the file history of the '581 Patent application in July, 2002. J.A. 803–06;

J.A. 947–48. Ms. Benado testified that, as part of that task, she reviewed the assignment and concluded that it transferred the '581 Patent application from AllAdvantage.com to Alset. J.A. 948; J.A. 950–51; J.A. 952–56.

- Around the same time, Ms. Benado filed on behalf of Alset a terminal disclaimer during prosecution of the '581 Patent application. J.A. 987–88. The disclaimer represented to the Patent Office that Alset owned "the entire interest in" the '581 Patent application. *Id*.
- The '581 Patent issued in early 2003 and listed Alset as the assignee. J.A. 79. Alset paid that issuance fee, J.A. 990, and Alset's successors-in-interest have since paid the maintenance fees for the '581 Patent.
- In 2005, Alset warranted to the IV entity it assigned the '581 Patent that it was "the sole owner, assignee and holder of record title" of the '581 Patent. J.A. 863–64. That assignment was subsequently recorded at the Patent Office. J.A. 862.

The District Court cast aside this evidence based on its erroneous conclusion that the assignment was not reasonably susceptible to IV's construction. J.A. 21–24. This extrinsic evidence shows, *at the very least*, that the rights "in and to" a parent patent and "the goodwill of the business symbolized" by a parent patent are of an ambiguous scope—Alset, with input from counsel, immediately and consistently acted as if it owned the '581 Patent. It did so without objection from AllAdvantage.com or its successors at any time, including through the present. Upon issuance, the Patent Office notified the public that Alset was the '581 Patent's owner, creating a presumption that the assignment to Alset was valid. *SiRF Tech., Inc. v. Int'l Trade Comm'n*, 601 F.3d 1319, 1327–28 (Fed. Cir. 2010).

The idea that this was *unambiguously* contrary to the assignment language is impossible to accept.

The Court also erroneously concluded that, even if it could consider the extrinsic evidence, it did not conclusively support IV's construction because the evidence came from Alset's side of the transaction. J.A. 22–23. But nothing rebutted this evidence. There is no evidence that AllAdvantage.com or its successors ever believed that it retained ownership over the '581 Patent; indeed, AllAdvantage.com's consistent post-contract practice is perfect evidence—from its side of the transaction—that it believed the '581 Patent had been assigned.

At its core, the District Court's decision is based on the fact that other assignments in the chain-of-title expressly list the '581 Patent application as a transferred asset, while the AllAdvantage.com-Alset transaction does not. J.A. 23–24. This Court, however, does not "require[] a particular formula or set prescription of words" to transfer title. *Minco Inc. v. Combustion Eng'g, Inc.*, 95 F.3d 1109, 1117 (Fed. Cir. 1996). And, in this case, the language of the assignment, the nature of the '581 Patent as a continuation, and the extrinsic evidence all point to the same result: the AllAdvantgage.com-Alset assignment transferred title to the '581 Patent application to Alset.

III. The Patents-in-Suit Claim Patent-Eligible Subject Matter

A. The Legal Framework to Determine Patent-Eligibility at the Pleadings Stage

The legal and procedural framework to determine patent-eligibility issues is relatively straightforward. IV's opening brief in the companion *Capital One* appeal details the substantive law on patent-eligibility and applicable precedent. *Capital One* Br., at 24–31. Rather than repeat that law, IV incorporates it by reference and will only briefly summarize the applicable law relevant to this appeal.

1. The Prohibition on Abstract Ideas is a Narrow Exception to the Broad Classes of Statutory Subject Matter Under § 101

Section 101 contains four categories of patent-eligible subject matter: "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C. § 101. It is well established that Congress intended patent-eligible subject matter to be broad and encompass "anything under the sun that is made by man." *Diamond v. Chakabarty*, 447 U.S. 303, 309 (1980) (quoting S. Rep. No. 1979, 82d Cong., 2d Sess., at 5 (1952); H.R. Rep. No. 1923, 82d Cong., 2d Sess., at 6 (1952)). And it is undisputed that the Patents-in-Suit fall within one of those four, broad statutory categories. The issues on appeal revolve around the district court's conclusion that every claim of every

Patent-in-Suit is directed to a patent-ineligible abstract idea—an exception to the broad classes of patent-eligible subject matter. *Alice Corp. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014).

The Supreme Court has provided a two-part framework to separate ineligible patents covering untethered abstract ideas from those that remain patent-eligible. First, the court determines whether the claims are directed to an abstract idea. *Alice*, 134 S. Ct. at 2355. If so, the court then asks if the claim elements—both individually and as an ordered combination—transform the claim into a patent-eligible application. *Id.* If a claim fails both tests, it does not cover patent-eligible subject matter. In determining on which side of the eligibility line a patent claim falls, courts "tread carefully" because an expanded use of the abstract idea exception would "swallow all of patent law." *Id.* at 2354.

Determining if a claim is directed to an abstract idea can be unclear. The Supreme Court has declined to "delimit the precise contours of the 'abstract ideas' category." *Alice*, 134 S. Ct. at 2356–57. However, "[w]e know that mathematical algorithms, including those executed on a generic computer, are abstract ideas" and that "some fundamental economic and conventional business practices are also abstract ideas." *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1256 (Fed. Cir. 2014) (citing *Gottschalk v. Benson*, 409 U.S. 63, 64 (1972), *Bilski v. Kappos*, 561 U.S. 593, 611 (2010), and *Alice*, 134 S. Ct. at 2356)); *see also OIP*

Techs., Inc. v. Amazon.com, Inc., 788 F.3d 1359, 1362 (Fed. Cir. 2015) ("offerbased price optimization").

This Court has declined to extend those categories of abstract concepts to extinguish all software-based and computer-based inventions. This Court has "not purport[ed] to state that all claims in all software-based patents will necessarily be directed to an abstract idea." *Ultramercial, Inc. v. Hulu, LLC,* 772 F.3d 709, 715 (Fed. Cir. 2014). Indeed, the Court has found patent-eligible "claims reciting a solution that was necessarily rooted in computer technology to overcome a problem specifically arising in the realm of computer networks." *Versata Dev. Grp., Inc. v. SAP Am., Inc.,* 793 F.3d 1306, 1333 (Fed. Cir. 2015) (citing *DDR Holdings,* 773 F.3d at 1259).

In addition to the *Alice* framework, an important data point in the patent-eligibility analysis is the machine-or-transformation test. This Court, "in its efforts to make an 'abstract idea' less abstract," developed the machine-or-transformation test. *Versata*, 793 F.3d at 1332. That test inquires whether the method (1) is tied to a particular machine or (2) transforms a particular article into a different state or thing. *Bilski*, 561 U.S. at 602. The test remains a "useful and important clue" to patent eligibility under Supreme Court precedent. *Id.* at 604.

> 2. The Challenger at the Pleadings Stage Faces a High Burden—Showing That it is Not Plausible That the Claims Will Survive an Eligibility Attack Under a Clear-and-Convincing Burden of Proof

The stage of this case also counsels against an overly broad application of the abstract idea exception. The Defendants moved to dismiss this case prior to filing their answers via a Rule 12(b)(6) motion, prior to any disclosure of asserted claims, infringement contentions, invalidity contentions, and claim construction proceedings.

The Defendants' challenge is based on § 101, which this Court has concluded is a challenge to the validity of the Patents-in-Suit. *Versata*, 793 F.3d at 1330 ("[B]oth our opinions and the Supreme Court's opinions over the years have established that § 101 challenges constitute validity and patentability challenges."). The Defendants' invalidity-based challenge at the Rule 12 stage has two important consequences for this appeal.

First, "[i]nvalidity is an affirmative defense," *Commil USA, LLC v. Cisco Sys., Inc.*, 135 S. Ct. 1920, 1929 (2015), and Courts in the Third Circuit generally "will not rely on an affirmative defense ... to trigger dismissal of a complaint under Rule 12(b)(6)," *In re Tower Air, Inc.*, 416 F.3d 229, 238 (3d Cir. 2005). Under Supreme Court precedent, a complaint may only be dismissed via a Rule 12(b)(6) motion if the complaint fails to state a claim for relief that is plausible on its face. *Bell Atlantic Corp. v. Twombly*, 550 U.S. 544, 555 (2007). In the context

of a Rule 12(b)(6) dismissal based on an affirmative defense, the complaint itself must establish the defense such that it is not plausible that the plaintiff will be entitled to its pled relief. *See id.*; *Pani v. Empire Blue Cross Blue Shield*, 152 F.3d 67, 74–75 (2d Cir. 1998) (holding, in context of official immunity, that an affirmative defense "may be resolved by Rule 12(b)(6) if clearly established by the allegations within the complaint").

Under this law, the Defendants were required to show that it is not plausible that the Patents-in-Suit will survive their § 101 challenge in view of a full record. That is an exacting standard to meet. A more developed record, including claim construction, generally is required to adjudicate patent-eligibility issues. *Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Can. (U.S.)*, 687 F.3d 1266, 1273–74 (Fed. Cir. 2012). Rule 12(b)(6) determinations, however, are generally constrained to the complaint and its attachments. *See Schmidt v. Skolas*, 770 F.3d 241, 249 (3d Cir. 2014).

Second, as an invalidity defense, the Defendants' § 101 challenge is subject to the statutory presumption of validity under § 282. Under that statute, "[e]ach claim of a patent ... shall be presumed valid independently of the validity of other claims." Moreover, "[t]he burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity," 35 U.S.C. § 282,

and discharging that burden requires clear-and-convincing evidence. *Microsoft Corp. v. i4i Ltd. P'Ship*, 131 S. Ct. 2238, 2245–46 (2011).

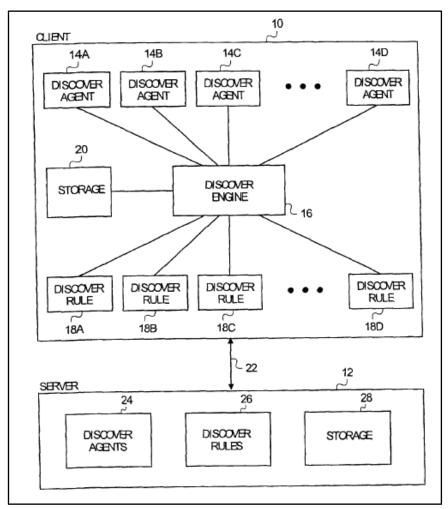
These standards set a high bar for affirmance. The Defendants must demonstrate that the only plausible outcome, after a full record, would be that each claim of the Patents-in-Suit fails to claim patent-eligible subject matter by clear and convincing evidence. They cannot meet that threshold, and the District Court erred as a result.

B. The '581 Patent Claims Patent-Eligible Subject Matter

The '581 Patent claims patent-eligible subject matter on its face, and, at a minimum, it is at least plausible that the '581 Patent will survive an eligibility attack upon review of a full record. The Patent solves problems unique to computer network diagnostic software. In the late 1990s, existing network diagnostic software was inflexible and static. To alter which data the software collected or how it analyzed that collected data, a programmer would need to modify the application source code or the built-in diagnostic routine. J.A. 86, '581 Patent, col. 1 ll. 25–41. In addition, many existing network diagnostic software applications required the user at the client computer to execute them—the software could not run automatically or in the background to collect data, which affected the reliability of the diagnostic software. *Id.*, col. 1 ll. 42–52.

The '581 Patent solves these problems by providing dynamic network-based diagnostic software. J.A. 86, '581 Patent, col. 11. 62–col. 21. 29. In particular, the Patent discloses particular software broken into three separate pieces—discovery agents, discovery rules, and a discovery engine—that are distributed over a client-server network. *See* J.A. 80, '581 Patent, Fig. 1. By separating the aspects of the software, the patented technology is customizable and may run in the background of the client computer. That solution is "necessarily rooted in computer technology," and the inventors arrived at it "to overcome a problem specifically arising in the realm of computer networks." *Versata*, 793 F.3d at 1333 (citing *DDR Holdings*, 773 F.3d at 1259). Thus, the '581 Patent claims are eligible for patent protection.

The Patent on its face shows that it is rooted in the technological arts. Figure 1 of the '581 Patent depicts the client-server environment that houses the the discovery agents, discovery rules, and discovery engine that make up the diagnostic software:



J.A. 80, '581 Patent, Fig. 1.

Within the system, the discovery agents are computer programs that collect information about a computer, such as the client computer. J.A. 87, col. 3 ll. 7–12. Those agents may be transferred from the server to the client computer over a communication link, and may be downloaded in the background. J.A. 80, '581 Patent, Fig. 1; J.A. 87, '581 Patent, col. 3 ll. 50–62, col. 4 ll. 8–32.

The agents collect information, such as the amount of disk drive space in the client computer, and provide that information to the discovery engine. J.A 80, '581 Patent, Fig. 1; J.A. 87, '581 Patent, col. 4 ll. 13–25. The discovery engine is

configured to execute a discovery rule (a separate program from the discovery agent) and apply that rule to the collected data. J.A. 87, '581 Patent, col. 3 ll. 15–21, col. 3 ll. 58–62, col. 4 ll. 39–42; J.A. 88, '581 Patent, col. 6 ll. 52–60. After executing the discovery rule in the discovery engine, the client may communicate the diagnostic information (*e.g.*, analysis and collected information) to the server. J.A. 86, '581 Patent, col. 2 ll. 8–11.

Because the discovery rule, discovery agents, and discovery engine are separate, independent software modules that interact with one another, the patented software may be customized without having to alter the diagnostic software source code or routines. That technology is a new and useful client-server diagnostic software application, and it claims only one particular way of solving an entirely computer-centric problem.

1. Distributed Client-Server Diagnostic Software is Not an Abstract Idea

The '581 Patent is drawn to a *specific type* of client-server diagnostic software, not an abstract idea. The District Court did not address the computer-centric nature of the '581 Patent's invention, or its claims. Instead, the Court concluded that the claims of the '581 Patent are directed to "a method for performing the abstract idea of gathering, storing, and acting on data based on predetermined rules," which the Court concluded was "similar to the patent claims

that courts have concluded are directed to longstanding, well-known methods of organizing human activity." J.A. 51. The Court determined that "the Patent merely claims use of mathematical formulas" and "networked computers to 'generate information' and then make decisions based on that information." *Id*.

That holding was error. The Court improperly cleaved the client-server software nature of the Patent—which is at the heart of the invention—from the '581 Patent claims. Every independent claim is directed to the client-server diagnostic software detailed in the specification: communicating a discovery rule (computer code) to a computer system, executing discovery agents (different computer code) to collect data in the computer system, applying that discovery rule to generate a result (*i.e.*, executing computer code in the discovery engine to apply the rule to the collected data), and then communicating that result from the computer system. J.A. 90–92, '581 Patent, claims 1, 11, 20, 29, and 39. The dependent claims, among other things, further require the claimed software to be separate code sequences and scheduling the execution of the software. *E.g.*, J.A. 91, '581 Patent, claims 7, 8, and 9.

The Patent is thus directed to improved diagnostic software in a very particular computer system, and it improves how that diagnostic software operates. *See Alice*, 134 S. Ct. at 2358 (explaining that patents that "solve a technological problem" and "improve[] an existing technological process" are eligible for patent

protection). The claims are not, as the District Court concluded, "similar to the patent claims ... directed to longstanding, well-known methods of organizing human activity." J.A. 51. And even the case law relied upon by the District Court to make that analogy shows that the computer-rooted claims of the '581 Patent are not directed to organizing human activity:

- In *Intellectual Ventures I LLC v. Capital One Bank (USA), Nat'l Ass'n*, 792 F.3d 1363, 1367 (Fed. Cir. 2015), the Court concluded that the claims at issue were directed to the abstract idea of "tracking financial transactions to determine whether they exceed a pre-set spending limit."
- In Content Extraction & Trans. LLC v. Wells Fargo Bank, Nat'l Assn, 776 F.3d 1343, 1345, 1347 (Fed. Cir. 2014), the claims found to cover an abstract idea were generally drawn to "a method of 1) extracting data from hard copy documents using an automated digitizing unit such as a scanner, 2) recognizing specific information from the extracted data, and 3) storing that information in a memory."
- The Court in *Accenture Global Servs, GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1338–39, 1344–45 (Fed. Cir. 2013) concluded that claims for "generating tasks to be performed in an insurance organization" was directed to an abstract idea.
- In *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344, 1350 (Fed. Cir. 2014), the Court held that the claim-at-issue was directed to an abstract idea because it "describe[d] a process of organizing information through mathematical correlations and [was] not tied to a specific structure or machine."

Likewise, the '581 Patent does not "merely claim[] the use of mathematical formulas." J.A. 51. It is true that the claimed "discovery rule" can be "a series of Boolean operations, mathematical equations, or other comparisons or evaluations

of the collected data." J.A. 87, '581 Patent, col. 3 ll. 18–21. But, reduced to its basic level, all computer software code can be expressed in that fashion, and this Court—even post-*Alice*—has "not purport[ed] to state that all claims in all software-based patents will necessarily be directed to an abstract idea." *Ultramercial*, 772 F.3d at 715.

Moreover, the '581 Patent claims do not actually cover a mathematical formula. Instead, the claims are directed to transferring software code (a discovery rule) to a computer system, executing that code (via a discovery engine) on data collected by a different computer program (a discovery agent), and then transmitting the results from the computer system. The mathematical formula can simply be a small part of that larger process.

The solution embodied in the claims arose from problems with late-1990s diagnostic software applications. The '581 Patent claims solve those problems with new computer diagnostic software technology. The Patent is thus not directed to an abstract idea and is patent-eligible.

2. The Claims Contain Sufficient Limitations to Not Preempt All Applications of "Gathering, Storing, and Acting on Data Based on Predetermined Rules"

The Court also erred when it concluded that the '581 Patent claims lacked sufficient limitations to ensure that they did not preempt all applications of "gathering, storing, and acting on data based on predetermined rules." As detailed

above, the District Court's abstract idea holding was error. But even under the Court's abstract-idea formulation, it erred in its *Alice* step two analysis.

The idea of "gathering, storing, and acting on data based on predetermined rules" is particularly broad. It is not cabined to a computer implementation, computer network implementation, or type of software or software architecture.

Indeed, the Court's broad identified idea encompasses the inflexible and static prior art software disclosed in background of the '581 Patent—software that the '581 Patent's claims plainly *do not cover*. J.A. 86, '581 Patent, col. 1 ll. 18–59. That fact strongly suggests that the '581 Patent's claims are sufficiently narrow to not "risk disproportionately tying up the use" of the broad rules-based abstract idea the District Court purported to identify at the heart of the patent. *Alice*, 134 S. Ct. at 2354–55.

The '581 Patent claims, in contrast, are limited to a specific diagnostic software application. The claims are drawn to a dynamic diagnostic software system in which the discovery rules and discovery agents are separate and customizable. Each independent claim requires transmitting a discovery rule (specific software) to a remote computer system. In that remote computer system, the discovery rule is applied (via a discovery engine executing the rule as the specification explains) to data that has been collected by a discovery agent

(specific software that is separate code from the discovery rule). That result is then communicated over a communications network from the remote computer.

The separation of aspects of the diagnostic software in the client-server network provides an inventive concept—the ability to easily customize the diagnostic software on the fly and have the software run automatically and in the background on the client computer. The dependent claims further bind the distributed software application. *See*, *e.g.*, J.A. 91, '581 Patent, claim 6 ("wherein the discovery rule is transmitted automatically"); J.A. 91, '581 Patent, claim 7 ("the discovery agent and discovery rule are separate code sequences"). These are—quite plainly—only very limited and specific ways of implementing the general idea the District Court identified.

The improved computer application of the '581 Patent does not preempt all uses of gathering, storing, and acting on data based on predetermined rules. At a minimum, the '581 Patent contains sufficient limitations to survive a Rule 12(b)(6) motion. *Card Verification Solutions, LLC v. Citigroup Inc.*, No. 13-c-6339, 2014 U.S. Dist. LEXIS 137577, at *4, 11–12 (N.D. III. Sept. 29, 2014) (denying motion to dismiss where it was plausible that the method for "providing verification information for a transaction" could be performed by software).

3. The Claims Satisfy the Machine-or-Transformation Test—They Claim Client-Server Diagnostic Software That Performs Certain Operations

Lastly, the '581 Patent claims satisfy the machine-or-transformation test, which the District Court did not apply. *See* J.A. 51–60. As recited above, the system claims are directed to a specific machine—a client-server computer system that executes novel diagnostic software. That software transforms the state of the machine by transmitting and executing computer software code—the discovery rules and discovery agents—and by collecting, analyzing, and transmitting data within the computer system. The '581 Patent's tie to concrete computer technology confirms the results of the *Alice* test outlined above: the Patent (at least plausibly) claims patent-eligible subject matter.

C. The '434 Patent Claims Patent-Eligible Subject Matter

The '434 Patent is rooted in computer database search technology and improves upon existing technology by using a novel database structure and search process. It is "directed toward a method for locating information stored in a database using an index that includes tags and metafiles." J.A. 142, '434 Patent, col. 15 ll. 5–7. Indeed, the patented technology was developed at BellSouth (now part of AT&T). *See* J.A. 121, '434 Patent, (73) (listing BellSouth Intellectual Property Corporation as the initial assignee).

The '434 Patent solves a particular set of computer database search problems. When the '434 Patent was filed in 1999, the amount of computer storage in database systems was continually increasing. *See* J.A. 135, '434 Patent, col. 1 ll. 30–31. That increase lead to two primary problems with existing database search technologies: (1) database search results did not always return the information requested in the search and (2) database search results returned too much information. *Id.*, col. 1 ll. 30–57.

Computer systems also began to contain multiple databases, which raised additional technological challenges. J.A. 135, '434 Patent, col. 2 ll. 6–24. In particular, data stored in one database could be repeated in another database and a multi-database system may require multiple searches (*i.e.*, one search per database) to locate all of the requested data. *Id.* In layman's terms, these problems created a need for a "universal search vocabulary" to create faster and efficient database searches. *Id.*, col. 2 ll. 25–33.

The '434 Patent meets that need with a technological solution: "providing a method for locating information stored in a database using an index that includes tags and metafiles to locate the desired information." J.A. 135, col. 2 ll. 36–39. In the computer arts, indexes, tags, and metafiles are specific computer data types. The patented technology, carried out by software modules, constructs an index by utilizing various tags and metafiles linked to together. *E.g.*, J.A. 123, Fig. 1A; J.A.

124, Fig. 1B; J.A. 129, '434 Patent, Fig. 5; J.A. 140, '434 Patent, col. 11 l. 6–col. 12 l. 34. The Patent also specifically teaches the use of XML-based computer systems, and many claims are limited to XML databases. *E.g.*, J.A. 121, '434 Patent, (54); J.A. 142, '434 Patent, claim 1.

Employing those computer-based tools, the patented technology examines existing database records and creates a new database that can be searched with the new index structure. That novel database structure (whether XML-based or not) provides a universal search vocabulary to apply across the entire computer database system. The Patent thus improves how a computer database system functions—allowing the system to provide faster, more accurate search results than prior systems.

Because the '434 Patent discloses a new and useful improvement in computer technology to solve problems that existed in prior computer systems, it is eligible for patent protection. The District Court erred when it concluded otherwise.

1. Improved Computer Database Architecture and Search Technology—Including XML-Based Technology—is Not an Abstract Idea

The '434 Patent is not directed to an abstract idea—such as a mathematical algorithm, fundamental economic practice, or longstanding commercial practice (like hedging risk or using advertising as currency). *See DDR Holdings*, 773 F.3d

at 1256–57 (collecting Supreme Court and Federal Circuit authority). The claims do not relate to a business challenge, which on its own would not even disqualify them from eligibility. *See id.* (upholding eligibility of claims addressing "a business challenge (retaining website visitors)" that was "particular to the Internet"). The claims instead are drawn to improved database search technology, with many claims directed to XML-based database systems.

The District Court dismissed the computer-nature of the '434 Patent as mere "patent-ese" and effectively erased the technological disclosure from the Patent. J.A. 64–65 (stating that XML tags, metafiles, and index components are "nothing more than 'patent-ese'" and analyzing the claims "[w]hen the 'patent-ese' is stripped away" and the claimed steps are "boiled down"). The Court similarly determined that the XML-based limitations of the claims could not be considered as part of *Alice* step 1. J.A. 63–64. Without any technological tie to the Patent, the Court concluded that the claims are directed to the abstract idea of "creating an index and using that index to search for and retrieve data." J.A. 63. It concluded that such activity "can be easily analogized to a great deal of conduct taking place before computers or the Internet even existed," such as "search[ing] for a book in a library." *Id.*

Each conclusion was in error. The heart of the '434 Patent is improved computer database search technology that utilizes an index construed of tags and

metadata to facilitate searches. It is directed—at its core—to computer technology, not the idea of searching for library books using a card catalog.

The Court's decision to "boil[] down" the claims to remove supposed "patent-ese" limitations likewise runs afoul of *Alice*, as does its decision to not consider the XML-based claim limitations in step 1 of the *Alice* framework. The first step of the inquiry requires the Court to "determine whether *the claims at issue* are directed to [an abstract idea]." *Alice*, 134 S. Ct. at 2355 (emphasis added).

The claims at issue are not directed to the idea of simply "creating an index and using that index to search for and retrieve data." J.A. 63. For starters, the majority of the independent claims (four of seven) and half of the total claims are expressly drawn to XML-based database technology. J.A. 142–44, '434 Patent, claims 1, 19, 22, and 25. Beyond the claims, the title of the '434 Patent recites that the inventive index is comprised of "XML tags and metafiles." J.A. 121, '434 Patent, at (54). And the specification teaches "the present invention ... in connection with the XML language," J.A. 152, '434 Patent, col. 15 ll. 19–23. In total, the term "XML" is mentioned over 200 times in the specification.

The Court also improperly abstracted the concrete, computer database nature of the claims. Claims 1–6 of the '434 Patent detail creating an XML database and an index to search that database through specific steps: creating an index using

specific types of XML tags (domain tags and category tags); creating a metafile that corresponds to a first domain tag; and then creating the database by providing records that each contain an XML index component. J.A. 142, '434 Patent, claim 1. The dependent claims further detail the structure of the data in the database and the relationship between the XML tags. *Id.*, claims 2–6. They do not broadly cover creating any type of index and using that index to search and retrieve any type of data—whether using a computer database or not.

Nor do the remainder of the claims. Even the claims drawn to "searching a database" require specific operations to create a specific key that is then used to search the database—not simply the use of any index. *E.g.*, J.A. 142, '434 Patent, claim 7 (processing a series of metafiles and tags to, if certain conditions are met, "combin[e] the first tag and second tag to create a key" and then use that key to search the database); J.A. 143, '434 Patent, claim 14 (reciting similar limitations); J.A. 144, '434 Patent, claim 27 (reciting similar limitations); J.A. 143, '434 Patent, claim 19 (executing a query code on a client computer using an XML tag and a metafile, obtaining a set of XML tags from the client after executing the query code, and combining the set of XML tags into a key that is used to search the database); *see also* J.A. 143, '434 Patent, claim 22 (reciting steps that result in executing a query code to obtain a set of XML tags that are used to retrieve

database records). And one set of claims is drawn to creating a "metafile" by processing a series of XML tags. J.A. 143, '434 Patent, claim 25.

The first step of *Alice* required the District Court to hone in on what the claims were directed to—improved computer database search technology. The Court instead zoomed out beyond the claims, recasting the Patent as drawn to a computer-less abstract idea. That was error.

2. The '434 Patent Claims Do Not Preempt All Uses of "Creating an Index and Using That Index to Search For and Retrieve Data"

The District Court also erred when it concluded that the claims preempted all uses of index-based searching. The District Court's abstract idea is very broad—it covers creating any index and using that index in any way to search and retrieve data. The idea is not limited to any particular type of database scheme, or any type of index, such as a tag-based index, any method of creating that index, or any method of employing the index to search and retrieve data.

On their face, the claims cover narrow, patent-eligible applications of that recited abstract idea. As argued above, claims 1–6 are limited to one type of database structure that utilizes an XML-based index made up of specific types of XML tags and a metafile and whose records contain an XML component. J.A. 142, '434 Patent, claim 1. The dependent claims further detail the structure of the

data in database and the relationship between the XML tags. *Id.*, claims 2–6. Those claims do not preempt all uses of index-based searching.

The remaining claims similarly require specific processing of tags and metafiles to create a key used to search the database, as detailed above. *E.g.*, J.A. 142–43. None of the claims simply utilize generic computing components to broadly claim any type of index-based searching—indeed, there is nothing *generic* about them at all. They instead claim specific database search technology.

The District Court, without any record evidence, concluded that the '434 Patent's use of storage, databases, tags (including XML tags), and metafiles was "simply not inventive," merely involved "generic computer components," and were used to speed up manual document filing. J.A. 67, 68. The Court concluded that the claims limited to XML-based systems were insufficient, in part, because other claims did not require the use of XML and, regardless, the use of XML still preempted "using one entire language." J.A. 67, 69. Lastly, the Court concluded that the claims "are stated at such a high level of generality that the Court has difficulty contemplating of any methods of creating an index and using that index to search for and retrieve data on a computer database that would not be preempted by them." J.A. 69.

The District Court committed three principle errors in that analysis. First, it did not perform the claim-by-claim analysis that § 282 and *Alice* require. It instead

lumped the '434 Patent's claims together. But the '434 Patent has different sets of claims—some directed to XML-based systems, some directed to specific database searching methods, some directed to constructing a database to enable those searching methods, and some drawn to creating metadata files. Second, the Court failed to look at the elements of each claim in an ordered combination, instead dissecting each computer-related limitation and assessing its novelty. As outlined above, under the correct framework, each set of claims when considered as a whole are limited to a particular application of the District Court's recited abstract idea of index-based searching.

Lastly, the Court improperly rendered a number of factual findings at the Rule 12(b)(6) stage—when the analysis is constrained to the pleadings—and did so without any supporting evidence. For example, the Court found that the claim limitations were merely conventional (they are not), that the XML-limited claims still sufficiently preempted all index-based searching (they do not), and that the claims cover every index-based search method the Court could imagine (which they do not).

The Court's finding that the XML-limited claims (again, half of the claims) preempted all types of index-based searching is particularly problematic. There was no record evidence on the different types of computer storage systems implicated by the abstract idea—databases versus non-database table systems.

Even within the universe of database technology, there was no record on the different types of databases—XML versus non-XML—known to those in the art. There was likewise no evidence bearing on the ability of those in the art to practice index-based database searching via non-XML computer markup languages (such as HTML). Likewise, the Court did not receive any evidence about the ability of those in the art to practice index-based searching without employing the specific arrangement and processing of tags and metafiles called out in claims.

Ultimately, the Court's guess that the '434 Patent—and even its XML-limited claims—ties up all uses of index-based searching is not clear-and-convincing evidence at the pleadings stage to invalidate the Patent. IV respectfully requests that this Court reverse the District Court's dismissal.

3. The Claimed Database Search Technology Satisfies the Machine-or-Transformation Test

Lastly, the '434 Patent claims satisfy the machine-or-transformation test, which the District Court did not apply. *See* J.A. 62–70. The Patent claims improvements to database search technology. That claimed technology is tied to particular computer database systems; restructures the data in those systems, including the database record structures; and creates and utilizes tags, metafiles, indexes, query codes, and keys to search those restructured database records. The majority of the claims are directed to XML databases.

The claims are thus bound to particular computer database machines and processes. That useful and important clue to eligibility shows that it was at least plausible that the Patent is directed to patent-eligible subject matter.

D. The '002 Patent Claims Patent-Eligible Subject Matter

Lastly, the District Court erred when it concluded that the '002 Patent is directed to an abstract idea—"remotely accessing user specific information"—and lacks sufficient limitations on that idea. J.A. 71–76. The Patent is not directed to the unbounded idea of remote access to information simply carried out on a generic computer. The Patent instead provides a computer-technology solution (a mobile interface agent, which is specific software, used in a specific way). It does so to solve a problem that arose in the field of computer technology in in the late 1990s—how to retrieve computer files and data over a network irrespective of a user's location or device. It is thus patent eligible.

The '002 Patent is at issue in the companion *Capital One* appeal, and IV will not retread the arguments presented in that case. This Court's resolution of those eligibility issues in the *Capital One* appeal (an appeal from summary judgment) will affect the issues raised in this appeal for the '002 Patent. Thus, IV incorporates and largely rests upon its briefing in the *Capital One* appeal. *Capital One* Br., at 47–62.

The outcome of the '002 Patent in the *Capital One* appeal will impact this appeal. In *Capital One*, the district court ruled on the eligibility of the '002 Patent claims asserted in that case at the summary judgment stage. *Capital One* Br., at 47–62. By that point in the case, the parties presented a comprehensive record, including detailed findings by a Special Master. *Id.* The District Court, however, concluded that the asserted claims of the '002 Patent failed to claim patent-eligible subject matter. *Id.* That decision was in error, and IV is challenging it on appeal.

This case, in contrast, was decided at the pleadings stage. As a result, any outcome short of a full affirmance in *Capital One* will require reversal in this case under principles of *stare decisis* and logic—if any of the '002 Patent's claims were erroneously held ineligible at the summary judgment stage in *Capital One*, it is at least plausible that the Patent's eligibility will be upheld in this case. Should the Court affirm in full the District Court's holding in *Capital One*, that decision would render moot the eligibility issues for the '002 Patent claims that were asserted in the *Capital One* case (claims 9, 11, 34, and 37). Due to the intertwined issues in the two appeals, IV only raises here additional points relevant to this appeal.

> 1. Using a Mobile Interface to Access and Receive User-Specific Electronic Resources and Information in a Computer Network Environment is Not an Abstract Idea

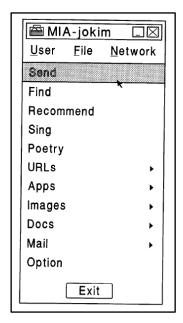
The District Court erred when it concluded that the '002 Patent claims "the abstract idea of remotely accessing user specific information" without any tie to computer technology. The Patent teaches that it "relates generally to the field of computer networks" and, more specifically, "a mobile interface agent that can be used to dynamically access resources stored either locally in the computing device or across a network." J.A. 110, '002 Patent, col. 1 ll. 7–12. The use of the mobile interface solves a unique computer-networking problem—how a user, from multiple devices or locations, can access and retrieve files and computer software that resides on a remote computer.

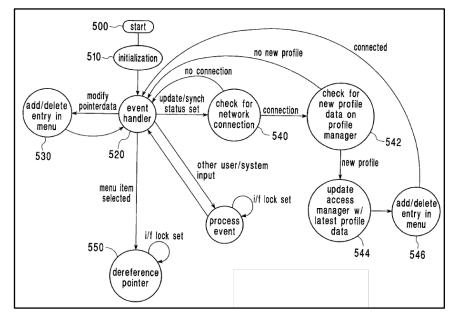
The District Court read the computer-technology-focused nature of the '002 Patent out of the claims. It expressly "disregard[ed] ... limitations such as a 'mobile interface'" so as to "not be held up by the inclusion of only theoretically limiting components of the claims" as part of its *Alice* step one analysis. J.A. 72. Freed from those ties, the Court concluded that "the claims at issues can loosely be analogized to calling a person from one location in order to obtain information located in another place." J.A. 72–73. It held that "the '002 Patent as a whole claims the abstract idea of remotely accessing user specific information." J.A. 72.

That holding was error. The mobile interface is at the '002 Patent's core. It is recited in *every claim*. Two sets of claims are directed to the structure of the mobile interface itself. *See* J.A. 118, '002 Patent, claim 25; J.A. 119, '002 Patent, claim 34. The specification teaches that "[t]he present invention is directed to a mobile interface agent," J.A. 112, '002 Patent col. 5 ll. 56–57, and the vast bulk of its disclosure focuses on the details of the mobile interface agent, *see* J.A. 111–12, '002 Patent, col. 4 l. 65–col. 5 l. 44 (identifying nine figures that depict different aspects of a mobile interface agent "in accordance with the present invention"). The '002 Patent mentions the mobile interface agent north of 150 times.

With the mobile interface at their center, the '002 Patent's claims cannot be analogized to a person calling another person at a remote location to obtain information. Nor are the claims directed to the concept of remotely accessing user specific information in any manner using any components.

A "mobile interface" is a particular software-driven machine: a "user interface accessible on different computing devices and capable of dynamically accessing user specific data stored on a network server and local device." J.A. 2334. In addition to a system-level disclosure, the Patent depicts an exemplary user interface and provides a software state machine that shows how the mobile interface agent operates at an under-the-hood level:





J.A. 95, 101, '002 Patent, Figs. 2, 7.

This detailed disclosure of the mobile interface confirms that the Patent is directed to what the specification says at the outset—an inventive improvement in "the field of computer networks." J.A. 110, '002 Patent, col. 1 ll. 7–8. That improvement manifests itself in the claims, each of are drawn to the mobile interface itself, the use of the mobile interface on a local device within a server-based network, and the computer network in which the mobile interface operates. *See, e.g.*, J.A. 118, '002 Patent, claims 1 and 11 (reciting claims drawn to the use of the mobile interface); J.A. 118–19, '002 Patent, claims 25 and 34 (reciting claims drawn to the mobile interface itself); J.A. 119, '002 Patent, claims 40 and 49 (listing claims to a network architecture with the mobile interface and its operations at their core). The dependent claims further narrow the types of

computer networks the mobile interface resides within and the types of resources retrieved. *E.g.*, J.A. 118, '002 Patent, claims 2–10.

As a whole, these claims show that the '002 Patent is directed to a computer network with software that performs specific, concrete operations. The claims are not a computerized version of simply one person calling another to receive information from a remote place.

2. The '002 Patent Claims a Specific Computer Software Application to Access and Receive Remote, User-Specific Information With a New Use of Pointers

Even if the '002 Patent claims were directed to the idea of "remotely accessing user specific information," the claims contain sufficient limitations that cover a patent-eligible application of that idea. As described above, the claims are directed to different aspects of a computer network system with a mobile interface that performs specific operations in a specific way by utilizing pointers. They do not preempt all types of remote information gathering. And the dependent claims are even narrower, limiting the types of data retrieved and the network in which the mobile interface is implemented.

The District Court did not conduct a claim-by-claim analysis for the '002 Patent or analyze the elements of each claim individually and as an ordered combination. Instead, the Court—without any supporting evidence—picked apart some of the claims and found that the mobile interface "on its own is not

inventive" and that the clam elements utilized conventional computer technology. J.A. 75. The Court concluded that the invention did not solve a computer-specific problem and, even if it did, failed to specify how the solution worked. J.A. 76. With regard to preemption concerns, the Court reasoned that the Patent could operate on any computer type of device and, as a result, "the invention would preclude any attempt to design another invention for remote access to user-specific information using any one of an infinite number of devices." J.A. 76.

Each finding was erroneous. Both *Alice* and § 282 required the Court to perform a claim-by-claim analysis for each claim element and ordered combination of claim elements, which the Court did not undertake. The '002 Patent contains three sets of claims: claims directed to a method that utilizes the mobile interface agent (claims 1–24), claims to the mobile interface agent itself (claims 25–39), and claims directed to the computer network system that employs the mobile interface agent (claims 40–49). While the District Court concluded that claim 1 was representative based on its review of claims 1–11, J.A. 70–71, it did not address claims 25–49 at any point in its decision. And those claims show that the Court clearly erred when it concluded that the mobile interface in the claims "is not inventive" and that the '002 Patent does not claim to "invent[] a specific mobile interface," J.A. 74–75: claims 25–39 expressly claim as a standalone invention a

new "mobile interface ... comprising" a novel combination of elements. J.A. 118–19, '002 Patent, claims 25 and 39.

There was no evidence in the pleadings that showed that the claimed mobile interface was conventional or uninventive (*i.e.*, that claims 25–39 are invalid on their face under §§ 102 or 103). Nor was there any evidence that the mobile interface, in combination with its novel use of pointers and the network environment it resides in, was merely conventional. And the record certainly lacked the type of clear-and-convincing evidence required to invalidate all of the Patent's claims at the pleadings stage.

The District Court also erred when it relied on other "interface" terms discussed in *Affinity Labs of Texas, LLC v. Amazon.com* and *Intellectual Ventures I LLC v. Capital One Bank (USA), Nat'l Ass'n.* In both cases, the patents-at-issue generically described the claimed interface-related terms. *See Intellectual Ventures I LLC v. Capital One Bank (USA), Nat'l Ass'n*, 792 F.3d 1363, 1370 (Fed. Cir. 2015) ("[T]he 'interactive interface' simply describes a generic web server with attendant software, tasked with providing web pages to and communicating with the user's computer."); *Affinity Labs of Tex., LLC v. Amazon.com, Inc.*, Case No. 6:15-CV-0029-WSS-JCM, 2015 U.S. Dist. LEXIS 77411, at *36–38 (E.D. Tex. June 12, 2015) ("[T]he customized user interface []

do[es] not identify any specific functionality or explain 'how' this customization is to be achieved.").

That is not the case here. Virtually the entire '002 Patent is about a mobile interface, and the Patent discloses its structure and operations in detail. And contrary to the District Court's erroneous holding, the '002 Patent is rooted in computer technology and specifies how the patented solution operates.

Claims 1, 11, and 40 recite, as part of a network environment, a mobile interface that includes plurality of pointers (*i.e.*, a specific type of computer data structure) that correspond to user-specific data in which the pointers are utilized to access that user-specific data. Claim 34 defines the mobile interface as comprising a plurality of pointers, and, upon initiating a pointer, the invention retrieves user-specific data from a local device or a network server. Claims 25 and 49 are even narrower, containing means-plus-function limitations confined to the specific computer network and mobile interface agent disclosed in the specification. The dependent claims are further computer-rooted, limiting the types of computer networks and user-specific data of the invention. The claims on their face thus demonstrate that they improve how the computer network operates and how the claims achieve that improvement.

The District Court also erred when it concluded that the '002 Patent does not solve a problem unique to computer networks. The ability of a mobile device to

dynamically access software programs, applications, and computer files stored on a remote computer is a problem unique to computers almost by definition. *See* J.A. 111, '002 Patent, col. 4 ll. 49–54; *Capital One* Br., at 47 (summarizing findings by Special Master).

Indeed, the Patent describes the problem as rooted in the growth of the number of computing devices operated by a user and the inability to remotely access and retrieve the data and software stored on one of those devices. J.A. 110, '002 Patent, col. 2 ll. 36–47.

Viewed through the correct prism, the '002 Patent claims do not create preemption concerns and do not "preclude any attempt to design another invention for remote access to user-specific information using any one of an infinite number of devices." J.A. 76. All of the claims are limited to a specific use of multiple pointers to retrieve the user-specific data via a mobile interface in a network with a server and local deice. They do not cover every way of retrieving user-specific data through any type of computer-based implementation using any type device or data-retrieval programming technique. Given these limitations, the Court's preemption findings (again, made without any supporting evidence) were in error.

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> The Mobile Interface-Focused Claims Satisfy the 3.

Machine-or-Transformation Test

Lastly, the Court erred when it failed to apply the machine-or-transformation

test. As outlined above, the '002 Patent claims a novel software-driven machine, a

mobile interface that accesses user-specific data in through a new use of pointers.

Use of the mobile interface transforms the computer network when in operation.

Indeed, the Patent provides a state diagram that shows how the mobile interface

transforms the computer network system during operation. By satisfying the

machine-or-transformation test, it is at least plausible that, after considering a

complete record, that the '002 Patent would survive the Defendants' patent-

eligibility attack.

CONCLUSION AND STATEMENT OF RELIEF SOUGHT

For the foregoing reasons, IV respectfully requests that this Court reverse

District Court's Order dismissing the complaints.

Dated: January 27, 2016

Respectfully submitted,

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ADDENDUM

IN THE UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF PENNSYLVANIA

INTELLECTUAL VENTURES I LLC, et al., Plaintiffs, v. ERIE INDEMNITY COMPANY, et al., Defendants.))) Civil Action No. 1:14-cv-00220) Judge Mark R. Hornak))
INTELLECTUAL VENTURES I LLC, et al., Plaintiffs, v. OLD REPUBLIC GENERAL INSURANCE GROUP, INC., et al., Defendants.))) Civil Action No. 2:14-cv-01130) Judge Mark R. Hornak)))
INTELLECTUAL VENTURES I LLC, et al., Plaintiffs, v. HIGHMARK, INC., et al., Defendants.)))) Civil Action No. 2:14-ev-01131)) Judge Mark R. Hornak))

OPINION

Mark R. Hornak, United States District Judge

These are a patent infringement cases filed by Intellectual Ventures I LLC and Intellectual Ventures II LLC ("Intellectual Ventures," "IV," or "Plaintiffs") against three

separate groups of Defendants: the Erie Defendants,¹ the Highmark Defendants,² and the Old Republic Defendants³ (collectively "Defendants"). Now before the Court in these cases⁴ are Motions to Dismiss the respective Complaints filed by all Defendants.

The Erie and Highmark Defendants have moved to dismiss for lack of subject matter jurisdiction as to one patent (the '581 Patent), Dkt. No. 14-220, ECF No. 74, for failure to state a claim as to two patents (the '581 Patent and the '434 Patent) based on allegations that the patents are directed to patent ineligible subject matter, and also for failure to state a claim or, alternatively, to require a more definite statement with regard to the alleged claims. Dkt. No. 14-220, ECF No. 46; Dkt. No. 14-1131, ECF No. 47. The Erie and Highmark Defendants have also moved to strike a declaration relied upon by Plaintiffs in support of subject matter jurisdiction. Dkt. No. 14-220, ECF No. 82.

The Old Republic Defendants have moved to dismiss all claims against them, alleging that three patents (the '581 Patent, the '434 Patent, and the '002 Patent) are directed to patent-ineligible subject matter, and have requested that the Court take judicial notice of certain documents submitted in support of their Motion. Dkt. No. 14-1130, ECF Nos. 30, 33.

¹ These Defendants are Erie Indemnity Company; Erie Insurance Exchange; Erie Insurance Property & Casualty Company; Erie Insurance Company; Flagship City Insurance Company; and Erie Family Life Insurance Company.

² These Defendants are Highmark, Inc.; HM Insurance Group, Inc.; HM Life Insurance Company; Highmark Casualty Insurance Company; and HM Casualty Insurance Company.

³ These Defendants are Old Republic General Insurance Group, Inc.; Old Republic Insurance Company; Old Republic Title Insurance Group, Inc.; and Old Republic National Title Insurance Company.

⁴ The Court had previously consolidated the three actions for pretrial purposes and refers to ECF filing numbers in the 14-220 action unless otherwise indicated. They have since been deconsolidated. Due to the interlocking nature of the arguments presented by the parties, and resolved by this Opinion, it is filed as to each case.

After reviewing the papers filed by all parties and the relevant law, and after extensive, day-long oral argument on April 14, 2015, the Court will grant the Motions to Dismiss for the reasons that follow.⁵

I. BACKGROUND

The patents at issue in these suits are: (a) U.S. Patent No. 6,519,581 B1 ("'581 Patent"), entitled "Collection of Information Regarding a Device or a User of a Device Across a Communication Link," (b) U.S. Patent No. 6,510,434 B1 ("'434 Patent"), entitled "System and Method for Retrieving Information From a Database Using an Index of XML Tags and Metafiles," (c) U.S. Patent No. 6,546,002 B1 ("'002 Patent"), entitled "System and Method for Implementing an Intelligent and Mobile Menu-Interface Agent," and (d) U.S. Patent No. 7,757,298 ("'298 Patent"), entitled "Method and Apparatus for Identifying and Characterizing Errant Electronic Files."

The Erie and Highmark Defendants have moved to dismiss infringement claims relating to the '581 Patent on the grounds that this Court lacks subject matter jurisdiction over Plaintiffs' infringement claims as to that Patent because Intellectual Ventures does not own the Patent and therefore lacks standing to assert infringement of it. Dkt. No. 14-220, ECF No. 74. They also argue that the '581 and the '434 Patents are not directed to patent eligible subject matter, and thus no viable legal claim as to those Patents can be stated in the Complaints. Dkt. No. 14-220,

⁵ This multi-party, multi-parent, multi-argument case squarely implicates the state law of California, and federal law as announced by the Supreme Court, and the Third and Federal Circuits. The Opinion here, out of necessity, is of commensurate explanation and length.

⁶ In Case No. 14-220, IV alleges infringement of the '581 Patent, '002 Patent, '434 Patent, and '298 Patent against the Erie Defendants. In Case No. 14-1130, IV alleges infringement of the '581 Patent, '002 Patent, and '434 Patent against the Old Republic Defendants. In Case No. 14-1131, IV alleges infringement of the '581 Patent, '002 Patent, and '434 Patent against the Highmark Defendants.

⁷ The Old Republic Defendants have joined that standing Motion. Dkt. No. 14-220, ECF No. 77.

ECF No. 46; Dkt. No. 14-1131, ECF No. 47. Alternatively, they argue that all claims of direct and indirect infringement should be dismissed under Rule 12(b)(6) or alternatively that this Court should order Plaintiffs to provide a more definite statement as to all such claims. The Old Republic Defendants challenge the '581, '434, and '002 Patents by arguing that each is directed to patent-ineligible subject matter. ⁸ Dkt. No. 14-1130, ECF No. 30.

II. SUBJECT MATTER JURISDICTION OF INFRINGEMENT CLAIMS AS TO THE '581 PATENT

Whether this Court has subject matter jurisdiction over the instant action as to the '581 Patent is determined by the law of the Third Circuit because it is a procedural question "not unique to patent law." *Univ. of Utah v. Max-Planck-Gesellschaft Zur Forderung Der Wissenschaften E.V.*, 734 F.3d 1315, 1319 (Fed. Cir. 2013) *cert. denied sub nom. Caret v. Univ. of Utah*, 134 S. Ct. 2819 (2014). "A motion to dismiss for want of standing is properly brought pursuant to Rule 12(b)(1), because standing is a jurisdictional matter." *Constitution Party of Pa. v. Aichele*, 757 F.3d 347, 357 (3d Cir. 2014) (internal quotation marks and citation omitted).

The Third Circuit would categorize the challenge here as a factual one⁹ because it does not simply attack the sufficiency of the '581 Complaints, but rather attacks assertions supporting jurisdiction in those Complaints as factually inaccurate. *Id.* at 358. When factual challenges are lodged, a court is not bound to accept the truthfulness of the allegations in a complaint and may consider evidence outside the pleadings to satisfy itself of its jurisdiction. *Id.* It is a plaintiff's

⁸ The Erie and Highmark Defendants stated that they did not challenge the '002 Patent or the '298 Patent (asserted against the Erie Defendants only) in this Court because those Patents were subject to review before the USPTO. Dkt. No. 14-220, ECF No. 47, at 9 n.2. Based upon Old Republic's challenges, however, this Court concludes, for the reasons stated in this Opinion, that the '002 Patent is directed to patent-ineligible subject matter. The only patent not addressed in this Opinion is the '298 Patent, the infringement of which is asserted only against the Erie Defendants. Because there is no pending Motion requesting to either stay or dismiss the action as to the '298 Patent, the case against the Erie Defendants will remain live as to the '298 Patent.

⁹ The other possibility is a facial challenge, which is based on the sufficiency of the allegations of the Complaint alone. *Id.* at 358.

burden to prove that a court has subject matter jurisdiction. *Mortensen v. First Fed. Sav. & Loan Ass'n*, 549 F.2d 884, 891 (3d Cir. 1977). If a plaintiff lacks standing when the suit is brought, the Court lacks subject matter jurisdiction. *Aichele*, 757 F.3d at 357.

In the patent context, plaintiffs suing for infringement bear "the burden to show necessary ownership rights to support standing to sue." *Abbott Point of Care Inc. v. Epocal, Inc.*, 666 F.3d 1299, 1302 (Fed. Cir. 2012). To successfully assert standing, a plaintiff "must demonstrate that it held enforceable title to the patent at the inception of the lawsuit" or the infringement claims will be dismissed for lack of jurisdiction. *Abraxis Bioscience, Inc. v. Navinta LLC*, 625 F.3d 1359, 1364 (Fed. Cir. 2010). Patent assignments must be in writing, 35 U.S.C. § 261, and the writing "must show a clear and unmistakable intent to transfer ownership." *Univ. Patents, Inc. v. Kligman*, 762 F. Supp. 1212, 1219 (E.D. Pa. 1991) (citing *McClaskey v. Harbison–Walker Refactories Co.*, 138 F.2d 493 (3d Cir. 1943)). Courts interpreting assignment contracts to decide ownership matters look to state law to determine and apply the appropriate rules of interpretation. *Abbott*, 666 F.3d at 1302.

A. The Contentions of The Parties

The Patent Assignment ("Assignment Agreement") at issue here contains a list of seventeen (17) enumerated "patents and patent applications" owned by AllAdvantage.com¹⁰ and then states:

Assignor [AllAdvantage], does hereby assign unto the Assignee [Alset, Inc.], all right, including common law rights, title and interest in the United States of America, Canada, the European Union, and all other countries and jurisdictions of

¹⁰ The purported chain of ownership proceeded with the following assignments: (1) the inventors to Aveo, Inc.; (2) Aveo, Inc. to Sherwood Partners; (3) Sherwood Partners to AllAdvantage; (4) AllAdvantage to Alset, Inc.; (5) Alset, Inc. to Expeditionary Sound; and (6) Expeditionary Sound to Intellectual Ventures. Dkt. No. 14-220, ECF Nos. 76; 76-1–5; 76-8–9. Defendants only challenge the fourth transfer in this chain.

the world in and to *said* patents together with the goodwill of the business symbolized by *said* patents and applications and registrations thereof.

Dkt. No. 14-220, ECF No. 76-1, at 5-6 (emphasis added).

The Erie and Highmark Defendants have moved to dismiss all claims relating to the '581 patent, arguing that the Court lacks subject matter jurisdiction because IV cannot carry its burden of showing ownership, and thus has no standing to sue. 11 Dkt. No. 14-220, ECF No. 74. The Old Republic Defendants have joined that Motion. Dkt. No. 14-220, ECF No. 77. Defendants essentially contend that the assertions in Plaintiffs' Complaints that "Intellectual Ventures I is the owner and assignee of all right, title, and interest in and to the '581 . . . Patent[] and holds the right to sue and recover damages for infringement thereof, including past damages" are not true. *E.g.*, Dkt. No. 14-220, ECF No. 1 ¶ 22. Specifically, those Defendants argue that the chain of title for the '581 patent consists of six (6) transfers, and that while certain transfers contained language that unequivocally included the '581 Patent or its application, the fourth transfer in the chain enumerated certain specific patents and applications subject to that transfer, but omitted the '581 Patent or its then-pending application. Dkt. No. 14-220, ECF No. 75, at 9. 12 Because a plain reading of the Assignment Agreement shows no conveyance of, or even an intent to convey, the '581 Patent or its application, Defendants contend the Court should not review any

¹¹ After Defendants informed the Court of their intent to move to dismiss on these grounds, the Court gave Plaintiffs an opportunity to consider substituting the '581 Patent's parent, over which there is no articulated dispute as to ownership, for the '581 Patent in these lawsuits. Dkt. No. 14-220, ECF No. 68, at 2. On March 6, 2015, Plaintiffs filed a Notice of Asserted Patents in which they notified the Court that they "do[] not intend to substitute the parent of the '581 patent for the '581 patent." Dkt. No. 14-220, ECF No. 80.

¹² Defendants argue that because seventeen (17) patents and applications are specifically listed in the Assignment Agreement and then the document refers to "said patents" in transferring them, there is no ambiguity in the failure to include the '581 Patent's application in that contract. Rather, the document clearly shows the '581 patent was not included in the transfer. Dkt. No. 14-220, ECF No. 75, at 9. This is so even though the '581 Patent's parent was expressly listed and transferred in the document, because other pending applications related to the parent were listed and thus transferred. *Id.* at 10, 14.

extrinsic evidence pertaining to that Agreement in support of ownership and should instead dismiss all claims pertaining to the '581 Patent for want of subject matter jurisdiction.

IV counters by arguing that in the first place, a presumption of validity applies to the Assignment Agreement because it was recorded with the U.S. Patent and Trademark Office ("USPTO"), and Defendants have not met their burden of disproving ownership. Dkt. No. 14-220, ECF No. 81, at 8, 9. Moreover, Plaintiffs contend that the involved Assignment Agreement by its terms is sufficient to show a transfer of title to the '581 Patent's application (the '858 application) for either of two (2) reasons. First, because the '581 Patent's parent (the '983 Patent), was specifically listed in the Assignment Agreement, and because the '858 application was a direct continuation of that patent, the future patent right in the '581 Patent was contained within the '983 Patent, thus automatically bringing the application within the scope of "said patents" listed in the Assignment Agreement. *Id.* at 11. Second, the fact that the Assignment Agreement transfers "goodwill of the business symbolized by said patents and applications and registrations thereof" indicates an intent to transfer the '581 Patent's application because the '983 (parent) Patent is listed, goodwill "includes the intellectual property itself," and so the goodwill of the '983 Patent includes its continuation application. *Id.* at 13–14.

Furthermore, Plaintiffs argue, the Court is required to at least provisionally accept extrinsic evidence to determine if the contract is susceptible to either party's interpretation, *id.* at 16, and the extrinsic evidence illustrates the parties' intent to transfer. The extrinsic evidence IV offers to prove intent to transfer the '581 Patent's application through the Assignment Agreement from AllAdvantage to Alset is: (1) a Declaration of Paul Hurley, co-founder of the Assignee, Alset, Inc.; (2) an excerpt from the deposition transcript of Lisa Benado, the attorney who prosecuted the '581 Patent's application; and (3) documents showing actions taken by the

parties to the Assignment Agreement after it was executed.¹³ Dkt. No. 14-220, ECF No. 81-1–81-9.

Defendants reply by arguing that the presumption of validity cited by Plaintiffs is purely ministerial and has no effect on the Court's interpretation of what rights were transferred through the Assignment Agreement. Dkt. No. 14-220, ECF No. 84, at 7–8. As a result, they claim that Plaintiffs are simply wrong when they argue that Defendants must disprove intent to transfer ownership—rather, IV retains the burden of demonstrating ownership of the Patent to sustain jurisdiction of this Court. *Id.* at 8. Defendants further argue that there is no rule of law that automatically transfers related patent applications with their parent patents, and that the cases Plaintiffs cite in that regard are inapposite—in contrast, pending applications must be transferred by a written instrument in the same way as are patents. *Id.* at 9–11. Defendants also counter the suggestion that extrinsic evidence should be reviewed, saying that because the language of the Assignment Agreement is unambiguous, Plaintiffs should not be allowed to introduce such evidence when there is no language indicating a clear intent to transfer the patent at issue. *Id.* at 14–15. Lastly, the moving Defendants argue that even if extrinsic evidence is considered, the relevant factors do not tip in IV's favor to demonstrate ownership. *Id.* at 16–18.

B. The Rules of The Decisional Road

As an initial matter, recording an Assignment Agreement which lists multiple patents and applications with the USPTO does not create a presumption that a patent omitted from that express list of assigned property was in fact transferred. "While recording [a patent assignment

¹³ Those documents are: (1) a Revocation of Prior Powers of Attorney, Power of Attorney by Applicant and Notification of Change of Fee and Correspondence Address filed in the prosecution of Patent Application No. 09/844/858 [the '581 Patent's application]; (2) a copy of the '581 Patent, which issued on February 11, 2003; (3) a copy of a Terminal Disclaimer filed in the prosecution of the '581 Patent's application; and (4) a copy of a fee transmittal form filed with regard to the '581 Patent's application. Dkt. No. 14-220, ECF Nos. 81-5–8.

¹⁴ They also take issue with IV's assertion that "goodwill" includes the underlying intellectual property. *Id.* at 12.

with the USPTO] creates a presumption in [plaintiff's] favor if the validity of the Agreement is challenged, it has no bearing on the question of what substantive rights were actually transferred." Clouding IP, LLC v. Google Inc., 61 F. Supp. 3d 421, 431 n.12 (D. Del. 2014) reargument denied sub nom. Clouding IP, LLC v. AT & T Mobility LLC, No. 13-1342, 2014 WL 6466833 (D. Del. 2014); see also 37 C.F.R. § 3.54 ("The recording of a document . . . is not a determination by the Office of . . . the effect that document has on the title to an application, a patent, or a registration."). 15 IV's argument based on this principle simply does not hold water.

The parties agree that whether an assignment of rights dealing with the '581 Patent application occurred is a matter of California contract law. Dkt. No. 14-220, ECF Nos. 75, at 18–19; 81, at 8–9. However, their views diverge substantially on the question of what California law requires the Court to now do. ¹⁶

California positive law requires that "[t]he language of a contract is to govern its interpretation, if the language is clear and explicit, and does not involve an absurdity," Cal. Civ. Code § 1638 (2015), and states that "[w]hen a contract is reduced to writing, the intention of the parties is to be ascertained from the writing alone, if possible," *id.* § 1639. These statements read like the rules of contract interpretation in many other states by which courts preliminarily decide

Even if some presumption of ownership arose from the face of the '581 Patent listing Alset as the Assignee, the Court concludes that any preliminary burden on Defendants to rebut any presumption arising from the listing of Alset as the assignee on the face of the '581 Patent, SiRF Tech., Inc. v. Int'l Trade Comm'n, 601 F.3d 1319, 1327–28 (Fed. Cir. 2010), was more than fulfilled when Defendants pointed to the plain exclusion of the '581 Patent or its application from a specific list within the Assignment Agreement, the document which IV admits was relied upon to show ownership in the '581 Patent's application process. See Dkt. No. 14-220, ECF No. 81, at 9 ("[T]he Agreement from AllAdvantage to Alset was recorded at the USPTO as part of the '858 Application's prosecution."); cf. U.S. Philips Corp. v. Iwasaki Elec. Co., 505 F.3d 1371, 1375 (Fed. Cir. 2007) (holding that assignment present on the face of the patent is "not a conclusive indication" of patent ownership). This is especially true in light of the fact that IV retains the burden of proving ownership in order to confirm this Court's subject matter jurisdiction, Mortensen, 549 F.2d at 891; Abbott, 666 F.3d at 1302, meaning that Plaintiffs must point to a writing that shows "a clear and unmistakable intent to transfer ownership," Kligman, 762 F. Supp. at 1219 (citing McClaskey, 138 F.2d at 499)

¹⁶ And the Court cannot fault them for that divergence, because for the reasons that follow, the California Supreme Court's own precedent is not a font of clarity on the general rules of contract interpretation.

whether a contract is clear on its face and will accept parol (extrinsic) evidence *only if* the contract's terms are ambiguous. *See Murphy v. Duquesne Univ. Of The Holy Ghost*, 777 A.2d 418, 429 (Pa. 2001) ("Only where a contract's language is ambiguous may extrinsic or parol evidence be considered to determine the intent of the parties.").

However, California law adds a bit more spice to the contract interpretation recipe: while the familiar rule for many courts is that extrinsic evidence is wholly secondary, and should not be considered absent an ambiguity in the contract's terms, California law seemingly requires courts to consider extrinsic evidence at least a little bit in the first instance, along with the contract text at issue, to determine whether the contract is open to ambiguity. See Pac. Gas & Elec. Co. v. G. W. Thomas Drayage & Rigging Co., 442 P.2d 641, 645 (Cal. 1968) ("[T]he meaning of a writing can only be found by interpretation in the light of all the circumstances that reveal the sense in which the writer used the words. The exclusion of parol evidence regarding such circumstances merely because the words do not appear ambiguous to the reader can easily lead to the attribution to a written instrument of a meaning that was never intended.") (internal quotation marks, alterations, and citations omitted); Wolf v. Superior Court, 8 Cal. Rptr. 3d 649, 655 (Cal. Ct. App. 2004), as modified on denial of reh'g (Feb. 19, 2004) ("[I]t is reversible error for a trial court to refuse to consider such extrinsic evidence on the basis of the trial court's own conclusion that the language of the contract appears to be clear and unambiguous on its face."). California has therefore developed a "two-step process" for courts to use in deciding whether to admit parol evidence:

First the court provisionally receives (without actually admitting) all credible evidence concerning the parties' intentions to determine "ambiguity," i.e., whether the language is "reasonably susceptible" to the interpretation urged by a party. If in light of the extrinsic evidence the court decides the language is

"reasonably susceptible" to the interpretation urged, the extrinsic evidence is then admitted to aid in the second step—interpreting the contract.

Wolf, 8 Cal. Rptr. 3d at 656 (internal citations omitted). 17

Despite these broad statements, the extrinsic evidence offered must be "relevant to prove a meaning to which the language of the instrument is reasonably susceptible." *Pacific Gas*, 442 P.2d at 644. If the contract is not "reasonably susceptible" to the proposed construction, extrinsic evidence should not be admitted in any fashion. *See Producers Dairy Delivery Co. v. Sentry Ins. Co.*, 718 P.2d 920, 925 (Cal. 1986) ("While extrinsic evidence may be considered by a court as an aid in the interpretation of a written contract when it is relevant to prove a meaning to which the language of the instrument is reasonably susceptible, if the evidence offered would not persuade a reasonable man that the instrument meant anything other than the ordinary

However, as Justice Baxter explained in *Dore*, the majority, at least in that case, no longer appeared to adopt quite as broad a view of *Pacific Gas*, and instead seemed to hold that "a 'latent' ambiguity is simply one that becomes manifest when one attempts to apply the contract's language to the specific facts that gave rise to the parties' legal dispute. Even then, extrinsic evidence is admissible only to prove a meaning the contract's language will reasonably accommodate." *Dore*, 139 P.3d at 63 (Baxter, J., concurring). This reading seems to best comport with California positive law that "[t]he language of a contract is to govern its interpretation, if the language is clear and explicit, and does not involve an absurdity," Cal. Civ. Code § 1638 (2015), and "[w]hen a contract is reduced to writing, the intention of the parties is to be ascertained from the writing alone, if possible," *id.* at § 1639, as well as a long line of other California cases (though predominantly in the insurance context), which note that traditional contract interpretation rules apply and then never mention extrinsic evidence, *see*, *e.g.*, *State v. Cont'l Ins. Co.*, 281 P.3d 1000, 1004—05 (Cal. 2012), *as modified* (Sept. 19, 2012) ("[I]ntent is to be inferred, if possible, solely from the written provisions of the contract. If contractual language is clear and explicit, it governs.") (internal quotation marks and citations omitted).

Of note, even the court in *Pacific Gas* recognized that "extrinsic evidence is not admissible to add to, detract from, or vary the terms of a written contract"—the court stated only that courts should at least take a quick look at extrinsic evidence before recognizing its relevance or irrelevance in a given scenario. 442 P.2d at 645.

This rule calling for the provisional acceptance of extrinsic evidence has been strongly and more recently criticized by the California Supreme Court. For instance, in *Dore v. Arnold Worldwide, Inc.*, 139 P.3d 56, 62 (Cal. 2006), Justice Baxter, with whom Justice Corrigan joined, authored a concurring opinion stating, "[r]ead in its broadest sense, *Pacific Gas* thus stretched the unremarkable principle that extrinsic evidence is admissible to resolve a contractual ambiguity into a rule that parol evidence is *always* admissible to *demonstrate* ambiguity *despite* facial clarity. The effect is that, despite their best efforts to produce a clear written agreement, parties can never confidently conduct their affairs on the basis of the language they have drafted." Judge Kozinski has also made his disagreement with *Pacific Gas* known. *See Trident Center v. Conn. General Life Ins. Co.*, 847 F.2d 564, 568 (9th Cir. 1988) ("Two decades ago the California Supreme Court in [*Pacific Gas*] turned its back on the notion that a contract can ever have a plain meaning discernible by a court without resort to extrinsic evidence.").

meaning of its words, it is useless.") (internal quotation marks, citations, and alternations omitted); *Parsons v. Bristol Dev. Co.*, 402 P.2d 839, 842—43 (Cal. 1965) ("Extrinsic evidence is 'admissible to interpret the instrument, but not to give it a meaning to which it is not reasonably susceptible."). ¹⁸

C. Interpretation of The Assignment Agreement

In the context of this case, the Court concludes that the Assignment Agreement is not reasonably susceptible to multiple interpretations, with or without the benefit of extrinsic evidence. The Assignment Agreement clearly and unambiguously points to the conclusion that the '581 Patent (or, as is more relevant, its application at the time of transfer) was not among the patents and applications transferred, and the proffered extrinsic evidence shows a bald effort to add the Patent to a list from which it is excluded. The Assignment Agreement is simply not "reasonably susceptible" to that alternate interpretation. *Curry*, 48 Cal. Rptr. 2d at 631; *cf. Dow Chem. Co. v. Nova Chems. Corp. (Canada)*, 458 F. App'x 910, 914 (Fed. Cir. 2012) (interpreting Delaware law and finding no ambiguity in a contract attaching a schedule which expressly listed patents and excluded the one at issue; holding that a patent was never transferred and that interpreting the contract otherwise would have required reading the explicit list out of the contract). The Agreement, which is only two (2) pages in length, ¹⁹ specifically lists fifteen (15) patent applications and two (2) issued patents owned by AllAdvantage, and then assigns "said

[E]vidence of the meaning the parties gave to the contract language is only relevant if the contract language itself is reasonably susceptible to that meaning. Thus, extrinsic evidence cannot be used to show that when the parties said "Bunker Hill Monument" they meant "the Old South Church" or that when they said "pencils" they really meant "car batteries."

Curry v. Moody, 48 Cal. Rptr. 2d 627, 631 (Cal. Ct. App. 1995) (internal citations omitted).

¹⁸ As one California Court of Appeals has stated:

Which indicates only that the contract was not comprised of hundreds of pages of technical terms, and that a drafting error is arguably less likely to be made in these circumstances.

patents together with the goodwill of the business symbolized by said patents and applications and registrations thereof" to Alset. Dkt. No. 14-220, ECF No. 76-1, at 5-7. Absent a rule of law that implicitly transfers all continuations of existing patents automatically with their parent applications, ²⁰ the Court concludes from the face of the Agreement itself that the chain of title was broken with regard to the '581 Patent.

With regard to Plaintiffs' first proposed construction of the Assignment, that "said patents" does not actually mean the patents and applications expressly listed but instead means the patents and applications listed *in addition to* their continuation applications, the Court concludes that saying it is so does not make it so, and the Court simply cannot read that additional language into the Assignment Agreement without making it a wholly different agreement, ²¹ and thus the document is not reasonably susceptible to the proposed interpretation. Patent applications, like patents themselves, "shall be assignable in law by an instrument in writing." 35 U.S.C. § 261.

The Assignment Agreement here assigns the patents listed. It also assigns many patent applications, also specifically listed. Continuation or not, the Court cannot assume that a patent application meant to be conveyed would not be explicitly listed when fifteen (15) others are expressly included on the list. While the Court recognizes IV's argument, supported by Attorney Benado's deposition testimony that "[t]here's no particular set of assignment language that is universal so there's lots of ways of conveying title," Dkt. No. 14-220, ECF Nos. 81, at 19; 81-3, at 8; see also Minco, Inc. v. Combustion Engineering, Inc., 95 F.3d 1109, 1116–17 (Fed. Cir.

²⁰ The Court addresses this in more detail below.

²¹ As Abraham Lincoln once explained, "[T]here had been an attempt made to show that a calf had five legs—the way the point was to be established was by calling the tail a leg, but the decision of the judge was that calling the tail a leg, did not make it a leg, and the calf had but four legs after all." Michael Burlingame's *Abraham Lincoln: A Life, Volume 2* 468 (2008 The Johns Hopkins University Press).

1996), there do need to be actual words that would effect a "clear and unmistakable intent to transfer ownership," *Kligman*, 762 F. Supp. at 1219 (citing *McClaskey*, 138 F.2d at 499). Without an automatic rule of continuation transfer by operation of law, the Court concludes that it is wholly unreasonable to view the Assignment Agreement as having transferred the '581 Patent or its application.

1. An "Automatic Transfer" Rule?

IV does in fact contend that there is an automatic rule of transfer whereby continuation applications of existing patents move with their parent patents by operation of law when an assignment is executed.²² E.g., Dkt. No. 14-220, ECF No. 81, at 11–13. Plaintiffs specifically point to Sections 201.07 and 306 the Manual of Patent Examining Procedure ("MPEP") to advocate the view that "assignment of a parent patent automatically confers rights in direct continuations."²³ Dkt. No. 14-220, ECF No. 81, at 12. While this argument is not without some

A deed of assignment . . . by which a patentee of an invention conveys all the right, title, and interest which he has in the 'said invention' . . . and also all right, title, and interest which may be secured to him from time to time . . . carries the entire invention and all alterations and improvements and all patents whatsoever, issued and extensions alike[.]

²² "The question of whether or not an agreement provides for automatic assignment is a matter of federal [patent] law." SiRF Tech., Inc. v. Int'l Trade Comm'n, 601 F.3d 1319, 1326 (Fed. Cir. 2010).

²³ IV also cited several cases for the proposition that "future rights may automatically transfer with the transfer of a parent patent." Id. at 11 (citing Gerber Scientific Int'l, Inc. v. Satisloh AG, Satisloh N. Am., Inc., No. 07-1382, 2009 WL 2869705, at *4 (D. Conn. Sept. 2, 2009); E.I. Du Pont de Nemours & Co. v. Okuley, No. 97-1205, 2000 WL 1911430, at *26 (S.D. Ohio Dec. 21, 2000)); see also Dkt. No. 14-220, ECF No. 81, at 8 ("When a party assigns a patent and references an 'invention,' 'improvement,' or similar language, it presumptively assigns continuations absent express language to the contrary." (citing, e.g., DDB Technologies, L.L.C. v. MLB Advanced Media, L.P., 517 F.3d 1284, 1290 (Fed. Cir. 2008))). The Court concludes that a more accurate statement of the law is that "future rights may automatically transfer with the transfer of a parent patent if the parties so agree" and that the relevant term of the Assignment Agreement here does not contain language which allows for such automatic transfer. Okuley (a case cited by IV which the Federal Circuit disapproved of on another point of law, see Chou v. Univ. of Chicago, 254 F.3d 1347, 1358 (Fed. Cir. 2001)) states that "[a]n assignment which conveys the entire right, title, and interest in an invention includes 'all alterations and improvements and all patents whatsoever, issued and extensions alike, to the extent of the territory specified in the instrument." 2000 WL 1911430, at *26 (quoting Hendrie v. Sayles, 98 U.S. 546, 553-54 (1879)). The Court does not disagree—it merely notes that the rights transferred in that case were to an "invention." Neither Okuley, nor the Supreme Court decision quoted in it, contradicts the conclusion that in this case the Assignment Agreement does not express the parties' intent to convey continuation applications. The quoted Supreme Court case states:

passing facial logic, the Federal Circuit has explained that "[t]he MPEP sets forth PTO procedures; it is not a statement of law. Moreover, MPEP § 306 refers to a PTO requirement for issuing a patent from a CIP [continuation-in-part] application to an assignee; it does not alter the legal ownership rights in patent applications and issued patents." *Regents of Univ. of New Mexico v. Knight*, 321 F.3d 1111, 1121 (Fed. Cir. 2003) (citing *Molins PLC v. Textron, Inc.*, 48 F.3d 1172, 1180 n.10 (Fed. Cir. 1995)); *Atmel Corporation v. Information Storage Devices, Inc.*, 198 F.3d 1374, 1384 (Fed. Cir. 1999) ("[T]he courts are the final authorities on issues of statutory construction. They must reject administrative constructions . . . inconsistent with the statutory mandate or that frustrate the policy that Congress sought to implement."). Indeed, while *some* rights in future interests, such as express grants of "future inventions," may trigger an automatic transfer of an interest, *SiRF Tech.*, 601 F.3d at 1326, such a broad rule cannot govern this situation when the Agreement explicitly lists out each patent and application transferred, purports to transfer only "said patents" and omits one owned by the Assignor. IV's argument in this regard misses the mark.

Hendrie, 98 U.S. 546 at 553-54. The opinion later states:

An assignment of an invention secured by letters-patent . . . is a contract, and, like all other contracts, is to be construed so as to carry out the intention of the parties to it . . . it is well settled that the title of an inventor to obtain an extension may be the subject of a contract of sale, and when it is, the instrument by which the sale was effected is the proper subject of construction, in order to determine whether it secures to the purchaser any subsequent extension of the patent, or merely the patent for the original term.

Id. at 554 (emphasis added).

What this demonstrates is that the terms of an assignment are what govern the scope of what is transferred, not some "automatic" rule. And the Court agrees with Defendants that there are meaningful distinctions between the contractual language in cases like *Okuley* (transferring "the entire right, title, and interest in an invention") and *DDB Technologies* (conveying "ideas, inventions and improvements") which broadly conveys "inventions" or "ideas" to effect transfers of future rights by the agreement of the parties, as opposed to specifically enumerated patents and patent applications as in this case. *See* Dkt. No. 14-220, ECF No. 84, at 9–10 (comparing language of the Assignment Agreement with that in other cases).

There simply is no legal rule mandating that every time a parent patent is assigned, that patent's continuation application automatically follows. Rather, that "automatic transfer" would have to be based on the agreement of the parties, and generally includes language that transfers all future rights in an invention or an idea, rather than just a patent itself.²⁴

In *Bellehumeur v. Bonnett*,²⁵ a party made a statement to the USPTO that common ownership existed in a partnership "because he believed that under Section 306 of the Manual of Patent Examining Procedure that by assigning the parent patent to RHI Partnership, Bellehumeur and his co-inventors also assigned all the rights to any continuation patent applications." No. 00-863, 2006 WL 6635952, at *4 (C.D. Cal. Mar. 21, 2006) *aff'd*, 219 F. App'x 991 (Fed. Cir. 2007). The *Bellehumeur* Court then explained that "[d]uring the trial after remand, [the party] conceded that his interpretation of Section 306 was in error, and that RHI Partnership did not own the '870 application by virtue of the assignment of the '410 patent." *Id.* The court later noted that while the party "acted negligently in failing to fully research the factual background

²⁴ Plaintiffs and Defendants both cite *Euclid Chem. Co. v. Vector Corrosion Technologies, Inc.*, 561 F.3d 1340 (Fed. Cir. 2009) in support of their arguments. In *Euclid*, the Federal Circuit reversed a district court's decision not to consider extrinsic evidence of the parties' intent because the district court concluded an assignment contract was unambiguous under Ohio law. *Id.* at 1344. However, *Euclid* is distinguishable from the case here: in that case, the contract assigned "all my interest in . . . applications for patents and issued U.S. patent, namely [list of four (4) applications and one (1) issued patent] . . . any and all divisional applications, continuations, and continuations in part [of the listed patents]". *Id.* at 1342. The question was whether that language conveyed a continuation-in-part application to the issued listed patent. *Id.* Importantly, though, that continuation-in-part application had issued *prior to* the execution assignment agreement. *Id.*

So while the district court in *Euclid* had concluded that the agreement was unambiguous and conveyed all continuations-in-part of the listed patent (including the continuation-in-part which had issued before the agreement was executed), the Federal Circuit held that the assignment was ambiguous because it included all continuations-in-part, but also included a specific list which omitted the already-issued patent. *Id.* at 1343. Here, by contrast, the Assignment Agreement does not include language which would convey all continuations of listed patents, *and also* does not include the '581 Patent or its application. The Assignment Agreement therefore lacks the type of contradiction which the Federal Circuit determined to be ambiguous in *Euclid*.

²⁵ The relevant part of this case dealt with the issue of inequitable conduct based on, *inter alia*, misrepresentations to the USPTO regarding ownership of a patent. The district court had conducted a bench trial on infringement and awarded damages to the plaintiff, but the Federal Circuit subsequently vacated the judgment and remanded. *Bellehumeur v. Bonnett*, 127 F. App'x 480, 481 (Fed. Cir. 2005). The district court's opinion cited above is the decision on remand, which was summarily affirmed. *Bellehumeur v. Bonnett*, 219 F. App'x 991 (Fed. Cir. 2007) (per curiam).

regarding the assignment of the '410 patent and the legal effect of an assignment of a parent patent on continuation applications," there was no intent to deceive, as was required by the question involved in that case. *Id.* at *5.

That opinion was issued after the Federal Circuit remanded the case in the first instance. In the Federal Circuit's initial (unpublished) opinion, that court wrote:

[T]he January 1, 1996 assignment only assigns the invention claimed in the issued '410 patent, and the pending counterpart foreign applications. It lists no continuing or related domestic applications based on the '410 patent. At oral argument, Bellehumeur's counsel conceded that the '161 patent was not expressly mentioned in the January 1, 1996 assignment. Because patent rights must be transferred by written instrument, 35 U.S.C. § 261 (2000), any alleged intention by the named inventors of the '410 patent to transfer rights to the '161 patent is ineffective and is insufficient to establish Bellehumeur's standing.

Bellehumeur v. Bonnett, 127 F. App'x 480, 484–85 (Fed. Cir. 2005). The Federal Circuit does not appear to have adopted a rule automatically transferring continuation patent applications with their parent patents in written agreements, and the Court declines to adopt such a rule here. In the absence of such an automatic transfer rule, no amount of extrinsic evidence or argument can demonstrate that the Assignment Agreement is "reasonably susceptible" to IV's proposed interpretation that the phrase transferring "said patents," when included after an express list of patents and applications, also included an application omitted from that list.²⁶

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With regard to extrinsic evidence, IV's attorneys contend that the '581 Patent application was automatically transferred with the parent patent, and submit Mr. Hurley's Declaration to argue that at least one party to the transfer (Mr. Hurley) believed that such a legal rule applied (if he did not, one may wonder why he did not just include the patent application at issue in the list of seventeen (17) others patents and applications) because he apparently thought, as Alset's co-founder, that he negotiated an agreement to transfer ownership of "all assets" previously owned by his other company, Aveo, Inc. See ECF No. 81-2, at 3. Even if so, then that position essentially amounts to the premise underlying a unilateral mistake of law in which one side misunderstands the law at the time of contracting. Cal. Civ. Code § 1578. However, the other requirement for finding a unilateral mistake of law is that the other side knows the correct law but does not rectify the other party's misunderstanding. Id. No one argues that such was the case here.

2. Does The Assignment of Goodwill Save The Day?

IV's second argument, that the phrase "goodwill of the business symbolized by said patents and applications and registrations thereof" encompasses the '581 Patent's application, is similarly unavailing. For this proposed interpretation to be potentially reasonable, the '581 Patent's application would need to be included in the definition of "goodwill." That the Agreement states the "goodwill of the business" is "symbolized by said patents . . ." is unhelpful to IV because it follows the same legal fallacy as the previous argument: if only the "said," or listed, patents are transferred, and there is no automatic rule of law that transfers child patent applications along with their parent patents, then the "goodwill of the business symbolized by said patents" refers to the goodwill associated with those said patents only and not unenumerated others. The remaining part of the phrase, ". . . said patents and applications and registrations thereof" again only references the applications and registrations of the listed ("said") patents.

With regard to Plaintiffs' argument that the '581 Patent's application is necessarily part of the "goodwill" of its parent patent (the '983 Patent) because it is the same intellectual property underlying the parent patent whose goodwill is being transferred, Dkt. No. 14-220, ECF No. 81, at 13–14, the Court has not discerned, nor has IV pointed to, any legal authority which treats pending patent applications synonymously with a general notion of "goodwill." *See id.* at 13–14 (asserting that the '581 Patent's application is "necessarily included" in the definition of goodwill without citation to authority). Instead, IV only argues that the "goodwill" term is similar enough to language conveying all interest in an "invention," which other courts have interpreted as conveying future rights. *Id.* at 14.

While a patent application is a form of intangible property, as is goodwill, the argument that the two are the same thing simply does not comport with a reasonable understanding of the term. See generally Weston Anson, The Intangible Assets Handbook 7 (ABA Section of Business Law 2007) (explaining the differences between finite-lived intangible assets like patents and copyrights and those that are indefinite-lived, such as goodwill and many trademarks). While recognizing that this case does not arise in the tax context, it is also notable that in tax matters, patent rights are treated as distinct from "goodwill." Compare 26 U.S.C. § 197(d)(1)(A) with 26 U.S.C. § 197(d)(1)(C)(iii); see also id. § 167(g)(6) (distinguishing depreciation deduction method allowed when dealing with "patents" rather than other intangibles); Newark Morning Ledger Co. v. United States, 507 U.S. 546, 554–56 (1993) (generally remarking on the differential treatment afforded patents and other intangibles over the years).²⁷

Similar interpretive concepts underlie the principles that courts are not to apply general provisions when a matter is more specifically dealt with in the same enactment, *Fourco Glass Co. v. Transmirra Products Corp.*, 353 U.S. 222, 228 (1957), and a more specific statute (or here, body of law), should govern over a more general one, *Morton v. Mancari*, 417 U.S. 535, 550—51 (1974) (a general statute will not be held to have repealed by implication a more specific one unless there is "clear intention otherwise"). Patent rights are considered separate and apart from other similar intangible property rights governed by distinct bodies of law, such as copyrights and trademarks, whereas goodwill more appropriately defines those intangible assets which are not already accounted for in other categories of assets.²⁸ The Court therefore

²⁷ Such distinct treatment indicates the general meaning of the terms do not necessarily overlap. Moreover, the very fact that there is an entire area of law devoted to protecting patent rights, *see* Patent Act, 35 U.S.C. § 100 *et seq.*, would seem to counsel against also lumping patent rights into the generic definition of goodwill, which is more of a catchall category containing essentially common law legal rules applicable to intangible rights not otherwise protected.

²⁸ Patent rights and goodwill appear to be distinct under California law as well. The Court would note that in *Allen* v. *Shaver*, 289 P.2d 255 (Cal. Ct. App. 1955), the court considered goodwill and patent rights separately, as it stated that at the time a business was dissolved, it "had no good will of any value and its only asset was the patent

cannot conclude that the Assignment Agreement is reasonably susceptible to the interpretation urged by IV, that the "goodwill" phrase includes the '581 Patent or its then-pending '858 application. Further, even if patent applications could be construed as intangible assets included in the definition of "goodwill" (since the Assignment Agreement suggests the parties agreed that goodwill can be "symbolized by" them),²⁹ they run into the same problem as with the "said patents" argument: the "patent applications" referred to as part of the goodwill are not the continuation patent applications of each listed patent, but the applications of those listed patents themselves.

3. The Avoidance of Illusory Contracts

IV also argues that the Court should not "read [the Assignment Agreement] to render a provision or term meaningless or illusory." Dkt. No. 14-220, ECF No. 81, at 13 (quoting Walker Digital, LLC v. Expedia, Inc., 2014 U.S. App. LEXIS 24712, at *10 (Fed. Cir. Dec. 30, 2014)). The Court agrees, and therefore concludes that it cannot read the Agreement in such a way that would make "said patents" and their "goodwill" essentially interchangeable terms (since according to IV, "goodwill" includes the intellectual property itself), thus rendering one or the other of them meaningless. That Plaintiffs argue the '581 Patent's application could fit within the categories of both "said patents" and "goodwill" proves the point.

As one California Court of Appeals has written, with regard to release agreements with an insurance company:

Appellants urge us to interpret the plain language in their release agreements discharging respondents from "any and all claims, demands, actions and causes of

application referred to in the pleadings herein, which was then of a value of \$97.20, and the total capital of the partnership as of said date, including the patent application and the invention represented thereby, was \$297.20." *Id.* at 259. The court believed the business both "had no good will of any value" and that it had a patent application worth \$97.20; that court, at least, did not find the terms synonymous.

²⁹ This may be an example of the parties' intent shining through when that intent is contrary to the general understanding of a term used in business.

actions" to mean "all claims except claims for bad faith, unfair practices or violations of the Insurance Code." Under the circumstances presented here, we decline to rewrite appellants' release agreements to include a concept they failed to enunciate at the time they accepted the terms of the settlement with their insurer.

Edwards v. Comstock Ins. Co., 205 Cal. App. 3d 1164, 1167 (Cal. Ct. App. 1988). Similarly in this case, Plaintiffs urge the Court to read the phrase "said patents" to mean "said patents and an additional patent application," and/or the phrase "goodwill symbolized by said patents and applications and registrations thereof" to mean "goodwill symbolized by said patents and at least one additional patent application" or "goodwill, which includes patents and patent applications themselves and is symbolized by said patents as well as any continuation applications of said patents." The Assignment Agreement is on its face not reasonably susceptible to such proposed constructions, since they are in reality alterations or amendments.

4. Consideration of a "California Quantity" of Extrinsic Evidence

Neither the terms of the Assignment Agreement, nor the extrinsic evidence offered by IV, allow the Court to accept Plaintiffs' proposed interpretation of the Assignment Agreement. That proposal essentially boils down to this: (1) Alset *meant* to negotiate an agreement that included the '581 Patent's application; (2)(a) Alset *forgot*, when negotiating an agreement that explicitly lists every patent and application being conveyed, to include any reference to the '581 Patent's application, or alternatively, or (2)(b) Alset did not believe it needed to list that application, because it mistakenly believed that transfer of the parent patent would effect a transfer of the continuation child application; and as a result, (3) this Court should somehow read the '581 Patent's application into the Assignment Agreement because that was the subjective intent of one party to the Agreement.

Offered in support of those premises is (i) the declaration of Alset's co-founder saying he meant to own the '581 Patent's application by virtue of this Agreement. But as the moving Defendants point out, that Declaration does not aid the Court in understanding *AllAdvantage*'s intent as the *assignor* of rights. Dkt. No. 14-220, ECF No. 84, at 16. And even if it did, the language in the Agreement is not "reasonably susceptible" to that interpretation. *Pacific Gas*, 442 P.2d at 644; *Curry*, 48 Cal. Rptr. 2d at 631. Also offered in support is (ii) the deposition testimony of Lisa Benado, the attorney who prosecuted the '581 Patent's application. But the Court again agrees with Defendants—her recollection is based on what she believed her client's intent to be, not AllAdvantage's. The expressed intent of one party to an Agreement is not conclusive as to the other party's intent.

Lastly, IV offers (iii) evidence of actions taken after the parties executed the Assignment Agreement: (1) a Revocation of Prior Powers of Attorney, Power of Attorney by Applicant and Notification of Change of Fee and Correspondence Address filed in the prosecution of Patent Application No. 09/844/858 [the '581 Patent's application]; (2) a copy of the '581 Patent, which issued on February 11, 2003; (3) a copy of a Terminal Disclaimer filed in the prosecution of the '581 Patent's application; and (4) a copy of a fee transmittal form filed with regard to the '581 Patent's application. Dkt. No. 14-220, ECF Nos. 81-5–8. All of this evidence assertedly speaks to Alset's belief in its ownership, and that it held itself out as the owner of the '581 Patent after executing the Assignment Agreement.

Notwithstanding this, however, the Court simply cannot conclude that the Assignment Agreement is reasonably susceptible to an interpretation, by its terms, that it conveyed ownership of the '581 Patent's application. Had Plaintiffs provided evidence of AllAdvantage's intent aside from its decision to do nothing to assert a further ownership interest (which is admittedly, not

nothing), this might be a closer call. But even under California's wide-ranging "at least take a look at the parol evidence" rule, the evidence offered must be relevant to a reasonable interpretation of the plain terms of the Agreement—it cannot be only relevant to a request to insert further language into the written document. Even conditionally accepting and reviewing the extrinsic evidence offered by Plaintiffs, the Court concludes that it does not provide a reasonable alternative interpretation to the plain terms of the contract. Thus, the contract cannot be deemed ambiguous, and the extrinsic evidence is not admissible to aid in further interpretation.³⁰

Additionally, some extrinsic evidence more firmly supports Defendants' position than Plaintiffs'. For one thing, Mr. Hurley's Declaration, while stating he intended to obtain by this acquisition all assets he held in a different company, also states that he negotiated a previous assignment in the '581 Patent's chain of title. Dkt. No. 14-220, ECF No. 81-2, at ¶ 4. That previous assignment, negotiated by Mr. Hurley, specifically lists as part of the assets transferred, both the '983 Patent ('581 Patent's parent) and the '858 application ('581 Patent's application). Dkt. No. 14-220, ECF No. 76-4, at 8. Mr. Hurley did not seem to believe that transfers of parent patents automatically conveyed their child applications at that prior time, so why now? Moreover, Defendants point to the fact that the Assignment Agreement "expressly transferred three family applications of the '983 patent by name and patent number," but did not include the '581 Patent's application. Those child patent

³⁰ Because of this conclusion, the Court will deny Defendants' Motion to Strike Hearsay Declaration of Paul Hurley, Dkt. No. 14-220, ECF No. 82.

³¹ The Court considers this assertion to be extrinsic because it is not evident from the face of the Assignment Agreement. IV did not dispute assertions regarding inclusion of '983 Patent "family members," though it had the opportunity both in its Opposition and at oral argument.

applications must have been considered separate property that needed to be included in order to be transferred, or why would they be listed?³²

After appropriately considering the extrinsic evidence within the perhaps unique context of California law, along with the language of the Assignment Agreement, the Court concludes that the Agreement is not reasonably susceptible to any of IV's proposed interpretations. The relevant Assignment Agreement does not transfer the '581 Patent or its application. Thus, there was a break in the chain of ownership of the '581 Patent. This means that IV lacks standing to assert patent infringement claims based on it and the Court lacks subject matter jurisdiction to adjudicate its claims of its infringement. All such claims relating to the '581 Patent will therefore be dismissed without prejudice.³³

III. PATENT-INELIGIBLE SUBJECT MATTER CHALLENGE³⁴

Some iteration of this part of the case is being litigated daily (if not hourly) in federal courts across the country.³⁵ In the wake of *Alice Corp. Party Ltd. v. CLS Bank Int'l*, 134 S. Ct.

³² If this was in actuality a drafting error, that is regrettable, but it is a slippery slope for courts to allow themselves to be persuaded to implant additional language (and in this case, another piece of property) into a contract that expressly enumerates the other pieces of property it purports to convey.

³³ Even if IV had carried its burden to show ownership of the '581 Patent and thus to achieve standing, it would make no difference because the '581 Patent is also directed to an abstract idea ineligible for patent protection, as the Court explains in greater detail below. Because it is not out of the question that an appeal to the Federal Circuit lies ahead, this Court finds it prudent to address both the standing and patent-eligibility questions as to the '581 Patent.

³⁴ Courts and litigants label this challenge differently, with some describing it as a challenge to a patent's validity and others characterizing it as a threshold issue of patent eligibility, different from the affirmative defenses contained in other sections of the Patent Act. This Court labels the challenge as one dealing with whether the claims at issue are patent eligible. See DDR Holdings, LLC v. Hotels.com, L.P., 773 F.3d 1245, 1259 n.6 (Fed. Cir. 2014) ("[P]atent-eligible does not mean patentable under, e.g., 35 U.S.C. §§ 102 and 103."); Chamberlain Group, Inc. v. Linear LLC, No. 14-5197, 2015 WL 4111456, at *6 n.2 (N.D. Ill. July 7, 2015) ("Patent eligibility does not mean patent ability under, e.g., 25 U.S.C. §§ 102 and 103. Defendant has not argued that the [patents] are invalid as anticipated by or obvious over prior art, nor have they argued that the claims at issue lack an adequate written description or are not enabled.") (emphasis in original).

³⁵ The Court can safely observe that some version of this part of the case is now playing out daily in courtrooms "from California to the New York island." Woody Guthrie, *This Land is Your Land* (Smithsonian Folkways Recordings 1997); *compare Enfish, LLC v. Microsoft Corp.*, No. 12-07360, 56 F. Supp. 3d 167 (C.D. Cal. 2014)

2347 (2014), the proverbial motions practice floodgates have opened and participants in patent actions who are charged with infringing software or other computer-related patents have moved at various procedural stages for rulings that the asserted patents are directed to patent-ineligible subject matter. See 35 U.S.C. § 101. Such litigants often attempt to frame patents at issue in the broadest terms available, analogizing the claims to age-old methods of organizing human activity which lack any inventive concept in attempts to bring the claimed subject matter within the scope of the Supreme Court's conception of unpatentable subject matter. And, as it turns out, many courts have agreed with them in the time since the Supreme Court decided Alice.

Parties asserting infringement, hoping to save their cases and pursue their infringement contentions, ³⁶ argue that (1) the pleading stage is too early to consider whether the subject matter is patent eligible because there has not yet been discovery or claim construction; (2) representative claims are insufficient to assess patents under § 101 and courts undertaking the task must instead perform a claim-by-claim analysis; (3) a presumption of validity attaches to patents because the USPTO has approved them; and relatedly, (4) the standard for judging the issue is too high—clear and convincing evidence—for early adjudication. On substantive grounds, they also attempt to frame their patents as claiming solutions to computer-specific problems with no "brick and mortar" analogs in order to show they are similar to claims upheld by the Federal Circuit post-*Alice*.

All of these eligibility arguments *de jour* are presented in this case, at least to some extent, and the Court will address them as appropriate here. Because many of the arguments

with Intellectual Ventures II LLC v. JP Morgan Chase & Co., No. 13-3777, 2015 WL 1941331 (S.D.N.Y. Apr. 28, 2015).

³⁶ Or as noted by one Circuit Judge, to at least fend off any case-ending motions long enough to pursue settlement talks. *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 719 (Fed. Cir. 2014) (Mayer, J., concurring) ("Given the staggering costs associated with discovery, '*Markman*' hearings, and trial, it is hardly surprising that accused infringers feel compelled to settle early in the process." (internal citation omitted)).

made both by IV and the Defendants revert to and then rely on first principles of § 101 jurisprudence, the Court concludes that it is necessary to consider the development of that case law at some length.

A. Legal Standard

Federal Rule of Civil Procedure 12(b)(6) provides for dismissal when a complaint fails to allege facts "sufficient to show that the plaintiff has a 'plausible claim for relief." *Fowler v. UPMC Shadyside*, 578 F.3d 203, 211 (3d Cir. 2009) (quoting *Ashcroft v. Iqbal*, 556 U.S. 662, 679 (2009)). Withstanding a motion to dismiss for failure to state a claim requires plaintiffs to "raise a reasonable expectation that discovery will reveal evidence of the necessary element[s]." *Thompson v. Real Estate Mortg. Network*, 748 F.3d 142, 147 (3d Cir. 2014). Assessing a complaint at the Motion to Dismiss stage requires courts to accept all "well-pleaded facts as true," but legal conclusions warrant no deference. *Fowler*, 578 F.3d at 210–11 (citing *Iqbal*, 556 U.S. at 677).³⁷

That debate does not carry over to this lawsuit, however, because no Defendant contests that the presumption of validity and the clear and the convicting evidence standard apply. See Dkt. No. 14-220, ECF No. 47, at 13 (Erie and Highmark Defendants' opening brief assuming the attachment of the presumption of validity and the application of the clear and convincing evidence standard); Dkt. No. 14-220, ECF No. 97, at 59:18–23 (Old Republic Defendants' statement that presentation assumes the presumption applies); Dkt. No. 14-1130, ECF No. 31, at 10 n.3 ("Old Republic's argument is presented herein as if the 'clear and convincing evidence' standard somehow applies"); Dkt.

³⁷ An examination of the Complaints in these cases reveals that they plead few facts but plenty of conclusions. There is a debate as to whether the 35 U.S.C. § 101 inquiry on patent eligibility is looped in with invalidity defenses that must be proved by defendants by clear and convincing evidence, and whether the presumption of validity contained in 35 U.S.C. § 282 applies. See, e.g., Execware, LLC v. BJ's Wholesale Club, Inc., No. 14-233, 2015 WL 4275314, at *3 (D. Del. July 15, 2015) ("Some members of the United States Court of Appeals for the Federal Circuit have suggested that 'any attack on an issued patent based on a challenge to the eligibility of the subject matter must be proven by clear and convincing evidence[,]' CLS Bank Int'l v. Alice Co. Pty. Ltd., 717 F.3d 1269, 1304—05 (Fed. Cir. 2013) (Rader, J., concurring-in-part and dissenting-in-part), but at least one other member of that Court has come to the opposite conclusion, see Ultramercial, Inc. v. Hulu, LLC, 772 F.3d 709, 720—21 (Fed. Cir. 2014) . . . (Mayer, J., concurring), all of which has led to some uncertainty regarding the appropriate standard of proof in Section 101 cases."); Intellectual Ventures I LLC v. Symantec Corp., _ F. Supp. 3d __, Nos. 10-1067; 12-1581, 2015 WL 1843528, at *5 (D. Del. Apr. 22, 2015) ("Beyond [the principle that the § 101 inquiry is a question of law], there is no clarity at this time as to the standard of proof that must be applied to factual disputes that may be intertwined with the issue of eligibility of a particular patent or claim."); id. at *6 (collecting cases from district courts on both sides of the divide and concluding that the patents at issue were patent ineligible regardless of which standard applied).

B. Patent Eligibility Pursuant to 35 U.S.C. § 101

35 U.S.C. § 101 authorizes the grant of a patent to anyone who "invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof. . . ." One exception to these general categories has been the focus of a great deal of litigation. That exception sounds simple: "[1]aws of nature, natural phenomena, and abstract ideas are not patentable." *Alice*, 134 S. Ct. at 2354. Specifically at issue here is whether the claims of three Patents involved here fall into the "abstract idea" category, ³⁸ and if they do, whether they contain sufficient limitations to transform them into claims for patent-eligible subject matter. So what exactly is an abstract idea? And what types of limitations are required to transform an abstract idea into patent-eligible subject matter?

The Supreme Court has instructed the lower courts to apply the following general framework:

(1) Are the claims at issue "directed to a patent-ineligible concept" (*i.e.*, a law of nature, natural phenomenon, or abstract idea)? ("Alice Step One")

If no, the claims are patent eligible. If yes, then courts are to ask:

(2) "[C]onsider[ing] the elements of each claim both individually and as an ordered combination," are there "additional elements" which present an "inventive concept" that "transform the nature of the claim into a patent-eligible application"

No. 14-220, ECF No. 56, at 20 (same). See DataTern, Inc. v. Microstrategy, Inc., No. 11-12220, 2015 WL 5190715, *7 (D. Mass. Sept. 4, 2015).

The Court will therefore assume that the patents at issue are presumptively valid and that the Defendants have the burden of demonstrating they are not directed to patent-eligible subject matter by clear and convincing evidence. The Court notes, however, that the clear and convincing standard also likely only applies to factual disputes which may underlie the § 101 analysis and not to the ultimate legal question. *Execuare*, 2015 WL 4275314, at *3.

³⁸ The parties do not dispute that the claims at issue fall into one of the statutory classes, but only whether the patent claims are drawn to an abstract idea. The Court will therefore so confine its analysis.

by demonstrating it is "significantly more than a patent upon the ineligible concept itself"? ("Alice Step Two")

Alice, 134 S. Ct. at 2355 (citing Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. – —, 132 S.Ct. 1289 (2012)) (internal quotation marks omitted). Claims which yield a "yes" answer to both questions are patent eligible, as are those which generate a "no" answer to the first question. Claims which yield a "yes" to question one, but a "no" to question two are not patent eligible.

Abstract ideas, a concept relevant to the first step, may be "preexisting, fundamental truth[s]" such as mathematical equations, and also encompass "method[s] of organizing human activity" or "longstanding commercial practice[s]" like intermediated settlement or risk hedging. Alice, 134 S. Ct. at 2356. It is important for courts to avoid overgeneralizing when conducting this inquiry, but they must also be cautious of hypersensitivity to technical language, as the inquiry is one of discerning the heart of the patented invention/true nature of the claim. Id. at 2355-57; Ultramercial, 772 F.3d at 714; Accenture, 728 F.3d at 1344; see also Tranxition, Inc. v. Lenovo (U.S.) Inc., No. 12-01065, 2015 WL 4203469, at *6 (D. Or. July 9, 2015) ("The first step of the Mayo/Alice analysis essentially requires the Court to ask: what are the claims generally trying to achieve?"); Enfish, LLC v. Microsoft Corp., 56 F. Supp. 3d 1167, 1173 (C.D. Cal. 2014) ("Courts should recite a claim's purpose at a reasonably high level of generality."). "This task is difficult, especially with regard to computer software. Because software is necessarily intangible, accused infringers can easily mischaracterize and oversimplify software patents." Enfish, 56 F. Supp. 3d at 1174 (quoting Oplus Techs. Ltd. v. Sears Holding Corp., No. 12-5707, 2013 WL 1003632, at *12 (C.D. Cal. Mar. 4, 2013), which states that "[a]ll software only 'receives data,' 'applies algorithms,' and 'ends with decisions.'" (emphasis in original)); see

also Enfish, 56 F. Supp. 3d at 1171 ("A basic truth is that algorithms comprise computer software and computer codes.").³⁹

The second step requires more than stating the abstract idea and adding the words "apply it," *Alice*, 134 S. Ct. at 2357, and must include additional features that amount to more than "well-understood, routine, conventional activity," *Mayo*, 132 S. Ct. at 1298. Preemption concerns are a central factor, as the second step is geared toward weeding out claims that would monopolize, or preempt, use of the abstract idea itself through artful drafting. *Alice*, 134 S. Ct. at 2357.

C. Relevant Supreme Court Precedent Through Alice

In order to assess the patent eligibility of the patents at issue here and to address the parties' enthusiastic arguments in those regards, it is necessary to place them in the context of the evolved legal principles applicable to the task.

In *Gottschalk v. Benson*, the Supreme Court held that a patent claiming a mathematical formula,⁴⁰ which could be performed either by the human mind or by a computer, was drawn to patent-ineligible subject matter because it attempted to patent one of the "basic tools of scientific and technological work." 409 U.S. 63, 67 (1972). Drawing its analysis from numerous prior cases, a particularly salient explanation came in its description of *Cochrane v. Deener*, 94 U.S. 780 (1876). The patent at issue in that case claimed a process for manufacturing improved-quality flour. *Benson*, 409 U.S. at 69. As the Court reasoned in *Cochrane*:

If one of the steps of a process be that a certain substance is to be reduced to a powder, it may not be at all material what instrument or machinery is used to effect that object, whether a hammer, a pestle and mortar, or a mill. Either may be

³⁹ As compared, for instance, with the "tangible, industrial process" at issue in *Canrig Drilling Technology Ltd. v. Trinidad Drilling Ltd.*, No. 15-656, 2015 WL 5458576, at *4 (S.D. Tex. Sept. 17, 2015).

⁴⁰ "The patent sought is on a method of programming a general-purpose digital computer to convert signals from binary-coded decimal form into pure binary form." *Gottschalk v. Benson*, 409 U.S. 63, 65 (1972).

pointed out; but if the patent is not confined to that particular tool or machine, the use of the others would be an infringement, the general process being the same.

Id. at 70 (quoting Cochrane, 94 U.S. at 787–88). The Court went on to explain that "[t]ransformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines." Id. at 70. The Court also made plain its concerns regarding pre-emption: "The mathematical formula involved here has no substantial practical application except in connection with a digital computer, which means that . . . the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself." Id. at 71–72.

Similarly, in *Parker v. Flook*, 437 U.S. 584 (1978), the Court held that a patent claiming "a formula for computing an updated alarm limit" during catalytic conversion processes in the petrochemical and oil refining industries is not patent eligible. *Id.* at 586. The patent's inclusion of "post-solution activity" (in the form of automatically adjusting the alarm limit after implementing the formula) was insufficient to render the claims patent eligible, because then "[a] competent draftsman could attach some form of post-solution activity to almost any mathematical formula" and preempt its use. *Id.* at 590. The Court held that "a claim for an improved method of calculation, even when tied to a specific end use, is unpatentable subject matter under § 101." *Id.* at 595 n.18.⁴¹

The Court contrasted the claims in *Benson* and *Flook* with those at issue in *Diamond v*.

Diehr to there hold that a "process for curing synthetic rubber which includes in several of its steps the use of a mathematical formula and a programmed digital computer is patentable subject matter." 450 U.S. 175, 177 (1981). The process there at issue addressed a specific problem in

⁴¹ The Court also stated that "[n]either the dearth of precedent, nor this decision, should . . . be interpreted as reflecting a judgment that patent protection of certain novel and useful computer programs will not promote the progress of science and the useful arts, or that such protection is undesirable as a matter of policy." *Id.* at 595.

the tire production industry—tires had previously been undercured or overcured because there was no way to measure the temperature inside a press without opening it. *Id.* at 177–78. The patented process provided for constant measurement of the temperature inside the mold, such measurements being automatically fed into a computer which used a mathematical equation to calculate the cure time and signal the computer to open the press at the optimal time. *Id.* at 179.

Unlike the claims at issue in *Benson* and *Flook*, which essentially purported to patent mathematical formulas themselves, the Court concluded that while the process in *Diehr* "admittedly employs a well-known mathematical equation, [it] do[es] not seek to pre-empt the use of that equation." *Id.* at 187. ⁴² Instead, the Court recognized that "[i]t is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." *Id.* 187 (emphasis in original) (collecting cases). The *Diehr* Court also stressed the importance of considering the invention as a whole rather than dissecting its claims. *Id.* at 188. In addition, the Court described *Flook* as standing for the proposition that use of a mathematical formula (or other abstract idea) cannot be patented even if its use is limited to a "particular technological environment." *Id.* at 191, 192 n.14.

The Supreme Court's consideration of patent eligibility issues next came in *Bilski v. Kappos*, 561 U.S. 593 (2010). In *Bilski*, the claims purported to patent "both the concept of hedging [or protecting against] risk and the application of that concept to energy markets." *Id.* at 609. Aided by the analysis in *Benson*, *Flook*, and *Diehr*, the Court held that the involved patent

Rather, they seek only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process. These include installing rubber in a press, closing the mold, constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening the press at the proper time.

⁴² The Court continued:

application was drawn to the fundamental economic concept of "hedging," and that the patent claims lacked patent eligibility because allowing such a patent "would pre-empt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea." *Id.* at 611–12. Moreover, the claim limitations did no more than import "token postsolution components" or attempt to "limit[] an abstract idea to one field of use"—both of which the Court found insufficient in *Flook*. *Id.* at 612. Further, the "entire Court agree[d] that while the machine-ortransformation test is reliable in most cases, it is not the *exclusive* test" to determine patent eligibility. *Id.* at 613 (Stevens, J., concurring).

Then, in *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012), the Court unanimously held that process claims drawn to aiding doctors in determining the adequate dosage levels of certain drugs on autoimmune disease patients by applying natural laws⁴³ were not patent eligible. *Id.* at 1294. Explaining that claimed steps implementing the laws of nature must be more than "well-understood, routine, conventional activity previously engaged in by researchers in the field" to render them patent eligible, the Court held those at issue failed to do so, as they broke down to nothing more than directing the process to those who could administer the drugs and instructing that they "(1) measure (somehow) the current level of the relevant metabolite, (2) use particular (unpatentable) laws of nature (which the claim sets forth) to calculate the current toxicity/inefficacy limits, and (3) reconsider the drug dosage in light of the law." *Id.* at 1299.⁴⁴ The *Mayo* Court also explained that "to transform an unpatentable law of nature into a patent-eligible *application* of such a law, one must do more

⁴³ The laws of nature in the claims described "the relationships between the concentration in the blood of certain thiopurine metabolites and the likelihood that the drug dosage will be ineffective or induce harmful side-effects." *Id.* at 1294.

⁴⁴ "The upshot is that the three steps simply tell doctors to gather data from which they may draw an inference in light of the correlations." *Id.* at 1298.

than simply state the law of nature while adding the words 'apply it." *Id.* at 1294. Most importantly, the Court set out a two-step inquiry outlined above which courts must undertake when considering patents under § 101. The Court also described language in *Bilski*, explaining that while the machine-or-transformation test does not "trump[] the 'law of nature' exclusion," the test may be "an '*important and useful* clue' to patentability." *Id.* at 1303 (quoting *Bilski*, 130 S Ct. at 3225–27).

Finally, in *Alice*, a unanimous Supreme Court applied its holdings in these cases and held patents which "disclose a computer-implemented scheme for mitigating 'settlement risk'" ineligible for patent protection. 134 S. Ct. at 2351.⁴⁵ *Alice* emphasized the twin concerns which underlie patent law: (1) pre-emption and (2) protection. *Id.* at 2354–55.⁴⁶ As to the former, the

Alice, 134 S. Ct. at 2352 n.2.

Patent protection is, after all, a two-edged sword. On the one hand, the promise of exclusive rights provides monetary incentives that lead to creation, invention, and discovery. On the other hand, that very exclusivity can impede the flow of information that might permit, indeed spur, invention, by, for example, raising the price of using the patented ideas once created, requiring potential users to conduct costly and time-consuming searches of existing patents and pending patent

⁴⁵ The Court set out and analyzed the following method claim, which the parties agreed was representative:

[&]quot;A method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of:

[&]quot;(a) creating a shadow credit record and a shadow debit record for each stakeholder party to be held independently by a supervisory institution from the exchange institutions;

[&]quot;(b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record;

[&]quot;(c) for every transaction resulting in an exchange obligation, the supervisory institution adjusting each respective party's shadow credit record or shadow debit record, allowing only these transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order, and

[&]quot;(d) at the end-of-day, the supervisory institution instructing on[e] of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions."

⁴⁶ The *Mayo* Court also explicitly addressed these concerns:

Alice Court explained that if a patent's claimed subject matter would essentially grant a monopoly over the "basic tools of scientific and technological work" (i.e., laws of nature, natural phenomena, and abstract ideas), further innovation may be impeded. Alice, 134 S. Ct. at 2354. As to the latter, the Court instructed that the abstract ideas/laws of nature/natural phenomena exclusion must be carefully construed "lest it swallow all of patent law." Id. Since "[a]t some level, all inventions embody, use, reflect, rest upon, or apply" these excluded categories of subject matter, courts assessing claims against § 101 must "distinguish between patents that claim the building blocks of human ingenuity and those that integrate the building blocks into something more, thereby transforming them into a patent-eligible invention." Id. (internal quotation marks, citations, and alterations omitted).

The *Alice* Court concluded that (1) the claims at issue there were drawn to an abstract idea, intermediated settlement, *id.* at 2355, and (2) the claims included no "inventive concept sufficient to transform the claimed abstract idea into a patent-eligible application," *id.* at 2357 (internal quotation marks and citations omitted). With regard to its conclusion at *Alice* Step One, the *Alice* Court analogized the idea of intermediated settlement to patent claims struck down in previous cases, reiterating that mathematical formulas (like *Benson*'s "algorithm for converting binary-coded decimal numerals into pure binary form" and *Flook*'s "mathematical formula for computing 'alarm limits' in a catalytic conversion process") and "fundamental economic practice[s]" (such as *Bilski*'s "basic concept of hedging, or protecting against risk") are the types of abstract ideas which are not patent eligible. *Id.* at 2355–56. While the Court explicitly

applications, and requiring the negotiation of complex licensing arrangements. At the same time, patent law's general rules must govern inventive activity in many different fields of human endeavor, with the result that the practical effects of rules that reflect a general effort to balance these considerations may differ from one field to another.

declined to "delimit the precise contours of the 'abstract ideas' category," it easily concluded the claims were within the same category of business practices as those in *Bilski*. *Id.* at 2357.

At Alice Step Two, the Alice Court concluded that the claims recited nothing more than instructions to "implement the abstract idea of intermediated settlement on a generic computer" because the steps directing a computer to "create electronic records, track multiple transactions, and issue simultaneous instructions" are "purely conventional" tasks performed by computers. Id. at 2359. Recognizing that the Alice Step Two inquiry incorporates the Court's pre-emption concerns, the Court reasoned that using a computer to "obtain data, adjust account balances, and issue automated instructions" did not change the analysis, as those functions are all "wellunderstood, routine, conventional activities previously known to the industry." Id. The Court distinguished *Diehr* from *Benson*, *Flook*, and *Mayo*, explaining that the mathematical equation in Diehr was not patented on its own, but was instead used "in a process designed to solve a technological problem in 'conventional industry practice.'" Id. at 2358. The Court further counseled that neither adding a generic computer along with the words "apply it," nor "limiting the use of an abstract idea to a particular technological environment," will transform an abstract idea into patent-eligible subject matter, id., but claims which "purport to improve the functioning of the computer itself" or "effect an improvement in any other technology or technical field" may withstand scrutiny. *Id.* at 2359.⁴⁷

⁴⁷ The Supreme Court issued its opinion in *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013) after *Alice*. In *Myriad Genetics*, the Court addressed the patent-eligibility of two types deoxyribonucleic acid (DNA), one that naturally occurred and one that was synthetically created. *Id.* at 2111. The Court held that the former, naturally occurring DNA was not patent eligible because it existed before Myriad found it and was not created, *id.* at 2117, while the latter was patent eligible because lab technicians "unquestionably create[]something new" when deriving it from the naturally occurring DNA. *Id.* at 2119.

D. The Post-Alice Legal Landscape

Shortly after the Supreme Court ruled in *Alice*, the Federal Circuit decided *Digitech Image Techs., LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1344 (Fed. Cir. 2014). In *Digitech*, the court of appeals held that method claims "describ[ing] a process of organizing information through mathematical correlations" which was "not tied to a specific structure or machine" claimed an abstract idea. ** *Id.* at 1350. The court described the claim as "a process of taking two data sets and combining them into a single data set, the device profile." *Id.* at 1351. The abstract idea, a "process of gathering and combining data that does not require input from a physical device," could not withstand scrutiny under § 101 because it had no further limitations that would cover less than "any and all uses of a device profile." *Id.* The Federal Circuit explained that "[w]ithout additional limitations, a process that employs mathematical algorithms to manipulate existing information to generate additional information is not patent eligible." *Id.*

In *buySAFE*, *Inc.* v. *Google*, *Inc.*, 765 F.3d 1350 (Fed. Cir. 2014), the Federal Circuit held the claims there at issue were directed to the abstract idea of "creating a contractual relationship—a transaction performance guaranty," *id.* at 1355 (internal quotation marks and

10. A method of generating a device profile that describes properties of a device in a digital image reproduction system for capturing, transforming or rendering an image, said method comprising:

generating first data for describing a device dependent transformation of color information content of the image to a device independent color space through use of measured chromatic stimuli and device response characteristic functions;

generating second data for describing a device dependent transformation of spatial information content of the image in said device independent color space through use of spatial stimuli and device response characteristic functions; and

combining said first and second data into the device profile.

Id. at 1351.

⁴⁸ The claim analyzed by the Federal Circuit provided:

⁴⁹ In summary, the claim was a method whereby a program receives a request for obtaining a transaction performance guaranty service involving an online commercial transaction, processes the request and underwrites the

citations omitted), which used a computer without "purport[ing] to improve the functioning of the computer itself," *id.* at 1354 (internal quotation marks and citations omitted). Concluding that the claims "do not push or even test the boundaries of the Supreme Court precedents under section 101," the Court of Appeals easily analogized the claims to the basic business practices the Supreme Court had invalidated in other cases. *Id.* at 1354–55. The court also referenced the concern that expansive patents will create a preemption problem that discourages innovation, *id.* at 1352–53, and noted that the exclusions from patent protection for laws of nature and abstract ideas apply even if a law or idea is narrow, *id.* at 1353.

Then, in *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709 (Fed. Cir. 2014), *cert. denied sub nom. Ultramercial, LLC v. WildTangent, Inc.*, 135 S. Ct. 2907 (2015), the Federal Circuit addressed (at the motion to dismiss stage) a representative claim directed toward a method whereby consumers can watch copyrighted media products for free over the Internet in exchange for viewing an advertisement when the advertiser pays for the content. *Id.* at 712. The case had a long history of appellate review⁵⁰ and in its third opinion, the Federal Circuit held that a representative claim's "ordered combination of steps recites an abstraction—an idea, having no particular concrete or tangible form," and that "[a]lthough certain additional limitations, such as consulting an activity log, add a degree of particularity, the concept embodied by the majority of the limitations describes only the abstract idea of showing an advertisement before delivering free content." *Id.* at 715. Specifically addressing the machine-or-transformation test and holding

first party, and the transaction service provider offers the performance guaranty service that binds the party. *Id.* at 1352. The district court had described the idea as "a third party guarantee of a sales transaction" which was applied "using conventional computer technology and the Internet." *Id.* at 1352 (quoting *buySAFE*, *Inc. v. Google*, *Inc.*, 964 F. Supp. 2d 331, 335–36 (D. Del. 2013)).

⁵⁰ After the district court dismissed the complaint, the Federal Circuit reversed, only to have that decision vacated and the case remanded by the Supreme Court, after which point the Federal Circuit reversed the district court again, and then once more had its decision vacated and the case remanded by the Supreme Court. *Id.* at 713.

it not satisfied, the Federal Circuit also stated that "[a]ny transformation from the use of computers or the transfer of content between computers is merely what computers do and does not change the analysis [and is insufficient]." *Id.* at 717.⁵¹

The Federal Circuit has also held ineligible four (4) patents which had been asserted against banks based on check deposit software in *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat'l Ass'n*, 776 F.3d 1343 (Fed. Cir. 2014). On appeal from a grant of a Rule 12(b)(6) dismissal, the panel unanimously held that patent claims which "generally recite a method of 1) extracting data from hard copy documents using an automated digitizing unit such as a scanner, 2) recognizing specific information from the extracted data, and 3) storing that information in a memory" were patent-ineligible. *Id.* at 1345. The court concluded that the patents were directed toward the "abstract idea of 1) collecting data, 2) recognizing certain data within the collected data set, and 3) storing that recognized data in a memory," *id.* at 1347, and went on to explain that those concepts are "undisputedly well-known" and performed by humans in general and banks in particular "for some time." *Id.* 52

Concluding that the patents were abstract at *Alice* Step One since they were directed to the basic concepts of "data recognition and storage," *id.*, the *Content Extraction* court turned to *Alice* Step Two and concluded that none of the patents' limitations made them patent-eligible

In his concurring opinion, Judge Mayer wrote that (1) the § 101 inquiry is a threshold issue that should be addressed at the outset of litigation because it deals with whether "claimed subject matter is even *eligible* for patent protection before addressing questions of invalidity or infringement," *id.* at 718 (Mayer, J., concurring); (2) the presumption of validity should not apply to § 101 challenges "[b]ecause the PTO has for many years applied an insufficiently rigorous subject matter eligibility standard," *id.* at 720 (Mayer, J., concurring); and (3) the Supreme Court essentially articulated a "technological arts test" in *Alice* which requires claims to "harness natural laws and scientific principles . . . and use them to solve seemingly intractable problems" to be patent eligible, and must "not only describe a technological objective, but set out a precise set of instructions for achieving it," *id.* at 721–22 (Mayer, J., concurring).

⁵² The court also rejected the plaintiff's argument that "claims are not drawn to an abstract idea because human minds are unable to process and recognize the stream of bits output by a scanner," noting that a similar argument did not stop the Supreme Court from invalidating the computer-implemented claims at issue in *Alice*. *Id*. at 1347.

because they "merely recite the use of this existing scanning and processing technology to recognize and store data from specific data fields such as amounts, addresses, and dates," which involved nothing more than the use of generic computer components "to perform well-understood, routine, and conventional activities commonly used in industry." *Id.* at 1348. Attempts to limit the abstract idea to "a particular technological environment" were held insufficient. *Id.* Moreover, the court found it unnecessary to review each and every claim of the patent to make its determination, reasoning that (1) the district court's own analysis led it to conclude the representative claim sufficed because "all the claims are 'substantially similar and linked to the same abstract idea," (2) the plaintiff never opposed the designation of specific representative claims in the court below, and (3) the plaintiff failed to identify any other claims that "purportedly contain[ed] an inventive concept." *Id.* ⁵³ The court also dismissed the idea that courts are precluded from considering § 101 challenges at the pleading stage because there has not yet been discovery or claim construction. *Id.* at 1349. Rather, courts must simply construe the claims in favor of the plaintiff at the pleading stage to appropriately resolve the issue. *Id.*

The singular case from the Federal Circuit to uphold patent eligibility post-*Alice* is *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245 (Fed. Cir. 2014). In a 2-1 decision, the majority described the patent claims as resolving the Internet-specific problem of merchant advertisers "lur[ing] the host website's visitor traffic away" by directing visitors from a host website to a merchant's website after clicking a link. *Id.* at 1248. The claims recognize when a link has been activated and retrieve data that maintains the "look and feel' of the host web page" while opening the merchant's website, allowing visitors to essentially view multiple pages open

⁵³ The court also rejected the plaintiff's argument that dependent claims recited additional steps that transformed the claims and made them patent-eligible. *Id*.

at once rather than being "transported to a third party's website." *Id.* at 1249–50, 1257.⁵⁴ The court focused on *Alice* Step Two, *id.* at 1257, and distinguishing past cases holding patent ineligible claims which "involve both a computer and the Internet," the court held these patents survived § 101 scrutiny because the "claimed solution is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks," *id.* at 1257.⁵⁵

Distinguishing *Ultramercial*, the *DDR* court explained that "the claims at issue here specify how interactions with the Internet are manipulated to yield a desired result—a result that overrides the routine and conventional sequence of events ordinarily triggered by the click of a hyperlink." *Id.* at 1258. Because the claims viewed together "recite an invention that is not merely the routine or conventional use of the Internet," and since those claims do not threaten preemption of "every application of the idea of increasing sales by making two web pages look the same," the court held the claims patent-eligible, ⁵⁶ as they created an inventive concept for remedying a problem unique to the Internet. *Id.* at 1259.

The *DDR* dissent by Judge Mayer posited that the patents "fail to meet the demands of section 101 because they describe a goal—confusing consumers by making two web pages look alike—but disclose no new technology, or inventive concept, for achieving that goal." *Id.* at 1264 (Mayer, J., dissenting) (internal quotation marks and citation omitted). Judge Mayer

The allegedly infringing system allows visitors on a "cruise-oriented (host) website" to click on a cruise advertisement, causing the system to "generate[] and direct[] the visitor to a composite web page that incorporates 'look and feel' elements from the host website and product information from the cruise line (merchant)." *Id.* at 1250.

⁵⁵ "Although the claims address a business challenge (retaining website visitors) [and "performance of an abstract business practice on the Internet or using a conventional computers" have been held patent-ineligible], it is a challenge particular to the Internet." *Id.* at 1257.

 $^{^{56}}$ The court did "caution . . . that not all claims purporting to address Internet-centric challenges are eligible for patent." *Id.* at 1258.

criticized the patents as "long on obfuscation but short on substance," as they include no more than generic computer elements which are "long-used in e-commerce." *Id.* Constraining an abstract idea's use to a "particular technological environment" does not necessarily transform it into patent-eligible subject matter. *Id.* at 1266. Lastly, his dissent focused on preemption concerns: "[t]he potential scope of DDR's patents is staggering, arguably covering vast swaths of Internet commerce." *Id.* at 1266.

In *OIP Technologies, Inc. v. Amazon.com, Inc.*, 788 F.3d 1359 (Fed. Cir. 2015), the Federal Circuit affirmed a grant of judgment on the pleadings on patent eligibility grounds, holding that patent claims directed to a "price-optimization method" which tested prices, gathered statistics on customer reactions, estimated outcomes based on that data, and automatically selected and offered a new price based on the outcome was similar to economic concepts held patent ineligible in the past. *Id.* at 1362–63. "[T]hat the claims do not preempt all price optimization or may be limited to price optimization in the e-commerce setting," the court explained, "do not make them any less abstract. *Id.* (citing *buySAFE*, 765 F.3d at 1355; *Accenture*, 728 F.3d at 1345.). At *Alice* Step Two, the court saw only "conventional computer activities or routine data-gathering steps" that did not limit the scope of the claims.⁵⁷ *Id.* The court also observed that "relying on a computer to perform routine tasks more quickly or more accurately is insufficient to render a claim patent eligible." *Id.* (citing *Alice*, 134 S.Ct. at 2359

⁵⁷ For instance, the court assessed one claim as follows:

[[]C]laim 1 recites "sending a first set of electronic messages over a network to devices," the devices being "programmed to communicate," storing test results in a "machine-readable medium," and "using a computerized system . . . to automatically determine" an estimated outcome and setting a price. Just as in *Alice*, "all of these computer functions are 'well-understood, routine, conventional activit[ies]' previously known to the industry." *Alice*, 134 S.Ct. at 2359 (quoting *Mayo*, 132 S. Ct. at 1294) (alterations in original); *see also buySAFE*, 765 F.3d at 1355 ("That a computer receives and sends the information over a network—with no further specification—is not even arguably inventive.").

("use of a computer to create electronic records, track multiple transactions, and issue simultaneous instructions" is not an inventive concept); *Bancorp Servs., L.L.C. v. Sun Life Assur. Co. of Can. (U.S.)*, 687 F.3d 1266, 1278 (Fed. Cir. 2012) (a computer "employed only for its most basic function . . . does not impose meaningful limits on the scope of those claims"); *cf. DDR Holdings*, 773 F.3d at 1258–59 (finding a computer-implemented method patent eligible where the claims recite a specific manipulation of a general-purpose computer such that the claims do not rely on a "computer network operating in its normal, expected manner")). ⁵⁸

In *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343 (Fed. Cir. 2015), the Federal Circuit affirmed the grant of a motion to dismiss as to a patent directed to "the [abstract] idea of retaining information in the navigation of online forms." *Id.* at 1348. The court used guidance from the patent's specification to determine whether additional features were "conventional," and agreed with the district court that limitations like "[a] computer-readable storage medium, comprising computer instructions for" were insufficient to provide an inventive concept, concluding that additional limitations "represent merely generic data collection steps or siting the ineligible concept in a particular technological environment." *Id.* at 1348—49.

Finally and most recently, the Federal Circuit upheld a district court's determination that claims at issue were not patent eligible in *Intellectual Ventures I LLC v. Capital One Bank (USA)*, 792 F.3d 1363 (Fed. Cir. 2015). In *Capital One*, the Federal Circuit held claims directed to budgeting claimed an abstract idea. ⁵⁹ At *Alice* Step Two, the Federal Circuit noted that

A method comprising:

⁵⁸ In a concurring opinion, Judge Mayer noted that "we have repeatedly sanctioned a district court's decision to dispose of them on the pleadings." *Id.* at 1365 (Mayer, J., concurring).

⁵⁹ The representative claim analyzed was:

"claiming the improved speed or efficiency inherent with applying the abstract idea on a computer [does not] provide a sufficient inventive concept." *Id.* at 1367. It held that claim elements such as a database, user profile, and a communication medium were all "generic computer components." Addressing a second patent, ⁶⁰ the court similarly held patent ineligible claims directed to "customizing web page content as a function of navigation history and information known about the user." *Id.* at 1371. That patent claimed an "interactive interface," which Intellectual Ventures had argued was a "specific application of the abstract idea that provides an inventive concept." *Id.* at 1370.

The Federal Circuit disagreed, explaining that "nowhere does Intellectual Ventures assert that it invented an interactive interface that manages web site content. Rather, the interactive interface limitation is a generic computer element," specifically a "a generic web server with attendant software, tasked with providing web pages to and communicating with the user's

storing, in a database, a profile keyed to a user identity and containing one or more user-selected categories to track transactions associated with said user identity, wherein individual user-selected categories include a user pre-set limit; and

causing communication, over a communication medium and to a receiving device, of transaction summary data in the database for at least one of the one or more user-selected categories, said transaction summary data containing said at least one user-selected category's user pre-set limit.

Id. at 1367.

⁶⁰ A representative claim for that patent states:

A system for providing web pages accessed from a web site in a manner which presents the web pages tailored to an individual user, comprising:

an interactive interface configured to provide dynamic web site navigation data to the user, the interactive interface comprising:

a display depicting portions of the web site visited by the user as a function of the web site navigation data; and

a display depicting portions of the web site visited by the user as a function of the user's personal characteristics.

Id. at 1369.

computer."⁶¹ *Id.* The Federal Circuit endorsed the district court's description that the claim elements do not confer patent eligibility because they "consist[] of nothing more tha[n] the entry of data into a computer database, the breakdown and organization of that entered data according to some criteria, . . . and the transmission of information derived from that entered data to a computer user, all through the use of conventional computer components, such as a database and processors, operating in a conventional manner." *Id.* at 1371. Distinguishing *DDR*, the Federal Circuit further explained that "[t]he patent at issue in *DDR* provided an Internet-based solution to solve a problem unique to the Internet that (1) did not foreclose other ways of solving the problem, and (2) recited a specific series of steps that resulted in a departure from the routine and conventional sequence of events after the click of a hyperlink advertisement." *Id.* The court concluded that the problems addressed in this case were not unique to the Internet, so *DDR* did not apply. *Id.*

The Court will now assess the pending Motions in the context of this body of authority, but first must address IV's procedural arguments, which are common to its presentations as to each Patent.

E. Plaintiffs' Procedural Arguments

As an initial matter, IV's arguments can be broken down into procedural and substantive categories. On the procedural end, IV asserts that the Court should not even conduct the § 101 inquiry because the case is not adequately teed up for such analysis. In addition to arguing that Defendants bear a heightened burden of proof to rebut the presumption of validity, IV also argues that (1) claim construction is necessary before the Court can resolve any issues under § 101, and (2) courts cannot rely on representative claims when conducting the § 101 analysis but must instead review each and every individual claim. Dkt. No. 14-220, ECF No. 52, at 16–20.

⁶¹ This type of claim element appears to the Court to be similar to the "mobile interface" claimed in the '002 Patent.

As to the latter argument, the Federal Circuit has held it permissible to assess representative claims when conducting the § 101 inquiry. Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat'l Ass'n, 776 F.3d 1343, 1348 (Fed. Cir. 2014); Ultramercial, 772 F.3d at 712. Recognizing that the Plaintiffs in this case oppose the designation of representative claims and insist on a claim by claim, fully Markman-ized analysis, this Court has reviewed the claims in the involved Patents and concludes that the representative claims set forth below are "substantially similar and linked to the same abstract idea" and further notes that Plaintiffs have failed to identify any other claims that "purportedly contain an inventive concept." See Content Extraction, 776 F.3d at 1348; Pragmatus Telecom, LLC v. Genesys Telecommunications Labs., Inc., F. Supp. 3d. , No. 14-26, 2015 WL 4128963, at *4 (D. Del. July 9, 2015) ("The Federal Circuit has held that the district court is not required to individually address claims not asserted or identified by the non-moving party, so long as the court identifies a representative claim and 'all the claims are substantially similar and linked to the same abstract idea.' (internal citation omitted)).⁶² Moreover, the § 101 analysis "is the same regardless of claim type, i.e., method claim, system claim, computer readable medium claim, etc." Trading Techs., Inc. v. COG, Inc., No. 05-4811, 2015 WL 774655, at *1 (N.D. Ill. Feb. 24, 2015); Amdocs (Israel) Ltd. v. Openet Telecom, Inc., 56 F. Supp. 3d 813, 820 (E.D. Va. 2014) (explaining that in Alice, Mayo, and Bilski, "the Supreme Court found that various claim types (method, system, etc.) directed to the same invention should rise and fall together"); see Novo Transforma Techs., Inc. v. Sprint Spectrum, L.P., No. 14-612, 2015 WL 5156526, *2 (D. Del. Sept. 2, 2015).

As to the former argument, the Federal Circuit seems to have concluded that claim construction is desirable, unless in reviewing the patents at issue, a district court concludes that it

⁶² While Plaintiff opposes the use of representative claims, it has identified no claim that is distinguishable in any material way, or the consideration of which would yield a different result.

isn't. Compare Bancorp Servs., L.L.C. v. Sun Life Assur. Co. of Canada (U.S.), 687 F.3d 1266, 1273–74 (Fed. Cir. 2012) (explaining that it "will ordinarily be desirable—and often necessary—to resolve claim construction disputes prior to a § 101 analysis, for the determination of patent eligibility requires a full understanding of the basic character of the claimed subject matter"), with OIP Technologies, Inc. v. Amazon.com, Inc., 788 F.3d 1359 (Fed. Cir. 2015) (affirming grant of judgment on the pleadings of ineligibility) and Content Extraction, 776 F.3d at 1345 (upholding dismissal of the complaint based on ineligibility determination at the Rule 12(b)(6) stage without claim construction). If a court concludes that "the basic character of the subject matter is 'readily ascertainable from the face of the patent,'" it may conduct the § 101 inquiry without first construing the claims. Microstrategy Inc. v. Apttus Corp., No. 15-21, 2015 WL _____, at *1 n.4 (E.D. Va. July 17, 2015) (quoting Cardpool, Inc. v. Plastic Jungle, Inc., No. 12-04182, 2013 WL 245026, at *4 (N.D. Cal. Jan. 22, 2013).

In considering the patents at issue here, the Court concludes that claim construction is not necessary prior to conducting the § 101 inquiry. First, Federal Circuit precedent does not mandate that approach, but instead counsels that it is generally desirable only when needed to understand the basic character of the claimed subject matter. *Bancorp Servs.*, *L.L.C.* 687 F.3d at 1273–74. If the Court can divine the requisite understanding without claim construction, as the Court can here, claim construction is not required.

Second, the terms that might need to be construed in this case are largely defined in the Patents, and those definitions amount to "little more than synonyms for generic conventional computer processing steps," *Tranxition*, 2015 WL 4203469, at *12, or conventional computer components. For instance, in the '581 Patent, any definitional confusion regarding terms such as "discovery agent" or "discovery rule" is resolved within the text of the Patent: discovery rules

"may be a series of Boolean operations, mathematical equations, or other comparisons or evaluations of the collected data," that "determine what, if any, action is to be taken based on the collected data," *id.* at 2:4–6; 3:17–18, and discovery agents are "separate programs (or code sequences)" that "collect information about a device or its user," '581 Patent, at 1:65–2:4; 3:22–25.

Third, as was the case in *Content Extraction*, to the extent that the Court would identify a "factual dispute" during the course of the Court's analysis that was outcome-determinative, the Court would resolve any such dispute in the Plaintiffs' favor at this procedural stage. 776 F.3d at 1349.

Fourth, and bearing on the last point, Plaintiffs had ample time in their extensive briefing and during the marathon oral argument to the Court to identify any claim terms they believed required construction and to then proffer preferred constructions to the Court. They did not do that. While Plaintiffs have generally referenced terms that they thought may require construction, Dkt. No. 14-220, ECF No. 52, at 19, they have not proffered any proposed constructions or explained how any proposed construction would affect the analysis, see Cyberfone Sys., LLC v. CNN Interactive Grp., Inc., 558 F. App'x 988, 991 n.1 (Fed. Cir. 2014) ("Cyberfone argues that claim construction must precede the § 101 analysis, but does not explain which terms require construction or how the analysis would change."); Uniloc USA, Inc. v. E-MD, Inc., No. 14-625, Doc. No. 315, at 5 (E.D. Tex. Aug. 19, 2015) (explaining that where the plaintiff failed to identify any constructions defendants put forth or offer evidence affecting constructions, the court would not "endorse a rule that a § 101 motion can only precede claim construction with a patentee's blessing"); Boar's Head Corp. v. DirectApps, Inc., No. 14-01927, 2015 WL 4530596, at *7 (E.D. Cal. July 28, 2015) ("Although it is defendants' burden to show

ineligibility, a court should look to the plaintiff to show some factual dispute requiring claim construction."); *DietGoal Innovations LLC v. Bravo Media LLC*, 33 F. Supp. 3d. 271, 289 (S.D.N.Y. July 8, 2014) (concluding that when patent claims are "sufficiently straightforward," no formal claim construction is required to understand their content).

Because the Court concludes that it is proper to proceed with the § 101 analysis without *Markman* claim construction, and having addressed and resolved IV's procedural arguments, the Court will now address the Defendants' substantive challenges to the Patents at issue.

F. The '581 Patent⁶³

1. Claims and Description of the '581 Patent

The'581 Patent, entitled "Collection of Information Regarding a Device or a User of a Device Across a Communication Link," includes the following representative claims:

- A method of collecting information, the method comprising:
 transmitting a discovery rule across a communication link to a computer
 system, wherein the discovery rule is to be applied to data about the
 computer system or a user to generate information, and wherein the data is
 collected by a discovery agent located in the computer system, and
 receiving the information from the computer system.
- 11. In a computer system, method of collecting information comprising:
 receiving a discovery rule across a communication link from a sender,
 applying the discovery rule to data about the computer system or a user to
 generate information, and wherein the data is collected by a discovery
 agent located in the computer system when the discovery agent is
 activated and without requiring action by the user; and communicating
 the information across the communication link back to the sender of
 the discovery rule.

These two claims show the method from both sides: while both are drawn to "a method of collecting information," one contains the steps which occur on the "sending" end and the other deals with the "receiving" and responding end. The Court concludes that these claims are

⁶³ As noted above, this Court has concluded that IV lacks standing to assert an infringement claim as to the '581 Patent. Because this Court cannot rule out the possibility that this is not the last court which will consider these matters, it believes it appropriate to set out its § 101 analysis as to the '581 Patent as well.

representative because the other independent claims are "substantially similar and linked to the same abstract idea" as that of the representative claims. *Content Extraction*, 776 F.3d at 1348; *Ultramercial*, 772 F.3d at 712. Those additional independent claims lack material differences: Claim 20 only contains the additional features of describing one way to prompt the transmission of a discovery rule ("a user request"), noting that a discovery agent may be automatically activated "without requiring action by the user," and the post-solution step of "providing the user with a response to the user request." Claims 29 and 39 are essentially the same as Claims 1 and 11, except that they include the use of a "computer readable medium having stored therein a plurality of sequences of executable instructions, which, when executed by a processor, cause the system to" perform the method set forth in the other Claims.

2. Analysis of the '581 Patent

The Erie and Highmark Defendants argue with regard to *Alice* Step One that the '581 Patent "contemplates [both] broad and trivial uses" of the abstract idea of "collecting information regarding a device or a user of a device." Dkt. No. 14-220, ECF No. 47, at 16. The Old Republic Defendants also contend that the Patent claims an abstract idea, characterizing that idea as "[c]ollecting information across a network and applying a predetermined rule to the collected information to make a decision." Dkt. No. 14-1130, ECF No. 31, at 5. Plaintiffs counter that contrary to Defendants' interpretation, the '581 Patent is in fact not directed to an abstract idea, but instead "to a computer system in which a discovery agent—a specific computer process—residing on a computer system collects computer data using a different computer program or code segment, known as a discovery rule." Dkt. No. 14-220, ECF No. 52, at 20. Arguing that the claims are drawn to "concrete computer technology" including "a computer-readable

medium," IV contends that the claims are patent eligible under *Alice*. *Id*. (citing '581 Patent, at Claim 29).

Further, IV attempts to distinguish the patents at issue in *Digitech*, *buySAFE*, *Accenture*, and *Alice*, arguing that those patents fell within a narrow class of recognized "abstract legal, business, and economic ideas," as well as one "drawn to a mathematical process that combined two data sets where (1) the process did not require any input from a physical device and (2) nothing in the claim tied the process to a computer processor." *Id.* at 21–22; *see also* Dkt. No. 14-220, ECF No. 91, at 7 (Oral Argument Presentation Slide describing abstract idea categories as (i) "Methods of Conducting Business"; (ii) "Managing Financial and Legal Relationships"; (iii) "Mathematical Equations"; and (iv) "Ideas Upon Themselves," and non-abstract idea categories as (i) "Specific Machines"; (ii) "Improvements to Existing Technological Processes"; and (iii) "Solutions Necessarily Rooted in Computer Technology to Overcome a Technological Problem").

Claim 1 recites a method for collecting information by (1) transmitting a discovery rule, which is essentially any code sequence, across a communication link, which is essentially any type of network; and (2) applying the code sequence to data about a computer system; in order to (3) generate information that is collected by a different code sequence, a "discovery agent"; and (4) receiving the information from the computer system.

Claim 11 recites the complementary method of (1) receiving a discovery rule, or code sequence, across a communication link, or any network; (2) applying the code sequence to data about a computer system or a user; in order to (3) generate information that is collected by a different code sequence, a "discovery agent," when that code sequence is activated without

prompting by a user; and (4) sending the information back across the network to the sender of the discovery rule.

Considering the '581 Patent as a whole, the Court concludes that the idea at the "heart" of the Patent, *Ultramercial*, 772 F.3d at 714, or "what the claimed invention is trying to achieve," Enfish, 56 F. Supp. 3d at 1173, is a method for performing the abstract idea of gathering, storing, and acting on data based on predetermined rules. This is similar to the patent claims that courts have concluded are directed to longstanding, well-known methods of organizing human activity. See, e.g., Capital One, 792 F.3d at 1367 (holding claims directed to "storing, in a database," a user identity with pre-selected rules and limits and "causing communication, over a communication medium and to a receiving device," containing information based on a pre-set limit were directed to the abstract idea of budgeting); Content Extraction, 776 F.3d at 1347 (holding patent ineligible claims directed toward the "abstract idea of 1) collecting data, 2) recognizing certain data within the collected data set, and 3) storing that recognized data in a memory"); Digitech, 758 F.3d at 1351 ("[A] process that employs mathematical algorithms to manipulate existing information to generate additional information is not patent eligible."); Accenture, 728 F.3d at 1344 (holding patent-ineligible claims directed toward the idea of "generating tasks [based on] rules . . . to be completed upon the occurrence of an event").

Indeed, the Patent merely claims use of mathematical formulas (and is not even limited to *specific* mathematical formulas) and networked computers to "generate information" and then make decisions based on that information. Using mathematical equations or code sequences (which are unlimited and unspecified) called "discovery rules" and "discovery agents" and implementing those code sequences on a generic computer does not make the underlying idea to which the Patent is directed any less abstract.

Nevertheless, even claims drawn to abstract ideas may be patent-eligible if they contain a sufficient "inventive concept" that would make the claimed material significantly more than a patent on the abstract idea itself. Alice, 134 S. Ct. at 2355. On Alice Step Two, the Erie and Highmark Defendants argue that the abstract idea is implemented "using one or more pieces of software called 'discovery agents,'" which collect the information and then use "other software called 'discovery rules'" to "dictate whether some action should be performed based on that information." Dkt. No. 14-220, ECF No. 47, at 16. An example of this Patent's application highlighted by Defendants is that a discovery agent will collect information about a user's computer, such as the available disk space, and a discovery rule will use that collected information to determine if the available disk space is running low, and generate a warning to the user if appropriate. *Id.* (citing '581 Patent, at 4:64–5:11). Defendants contend that "the alleged invention is embodied entirely in conventional computing components, such as 'any type of computer, including a general purpose computer." Id. (citing '581 Patent, at 10:13-14). More specifically, Defendants point to language in the Patent referring to typical computer components including "a client and a server," "a storage mechanism," and a generic "communication link." Id. They also explain that discovery rules "may be as simple as []conventional algorithm[s]," and that both discovery rules and discovery agents "are mere 'code sequences'—i.e., ordinary computer software." Id.

The Old Republic Defendants also point out that a discovery rule can be any "comparison or evaluation of the collected data," Dkt. No. 14-1130, ECF No. 31, at 10 (citing '581 Patent, at 3:19–21), and the Patent's application is not limited in any meaningful way, but can instead collect data on "wide ranging examples" spanning from "the font size used in windows that display text; or the user's hobbies, gender, or vacation preferences," *id.* at 11 (citing '581 Patent,

at Fig. 3). Defendants specifically compare Claim 1 of the '581 Patent to the claim held inadequate in *buySAFE*, 765 F.3d 1350, arguing it is similar to a claim "whereby a computer received a request for information over a computer network, processed that request, and sent information back." Dkt. No. 14-1130, ECF No. 31, at 11.

On the other hand, Plaintiffs state:

While the invention can be implemented on a general-purpose client and server computers, '581 Patent, [at 10:12–14], the programming of those computers to perform the claimed computer data transmission and collection methods places enough of a limit on the claims such that they do not preempt all uses of an abstract idea—the specific software disclosed and claimed in the '581 Patent is a technological innovation.

Dkt. No. 14-220, ECF No. 52, at 22–23. IV also argues that the claims satisfy the machine-or-transformation test, as they are "expressly tied to a networked computer system and, via the specific claimed software, transform a general computer into a special purpose computer." *Id.* at 21 (citing *Aristocrat Techs. Austral. Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008)).

The Court concludes that the '581 Patent is extraordinarily broadly drawn. The terms of the Patent itself indicate that "the invention may be practiced without these specific details." '581 Patent, at 2:67–3:1. But in discussing some details, the Patent also states that a "communication link can be any type of communication link using any type of communication medium," describing only one particular embodiment as coupling the client and server "across a network, such as a local area network (LAN), a wide area network (WAN), or the Internet," *id.* at 5:20–25; "[t]he computer system [shown in a particular figure] may be any type of computer, including a general purpose computer," *id.* at 10:13–15; and "[t]he computer-readable medium may be any type of magnetic, optical, or electrical storage medium including a diskette, magnetic tape, CD-ROM, memory device, or other storage medium," *id.* at 10:52–55.

Additional limitations, while adding "a degree of particularity," do not change the fact that the "concept embodied by the majority of the limitations describes only [an] abstract idea." Ultramercial, 772 F.3d at 715. Discovery rules and discovery agents are also very broadly defined in the Patent, see '581 Patent at 3:19-25 ("[D]iscovery rules may be a series of Boolean operations, mathematical equations, or other comparisons or evaluations of the collected data"; discovery agents are separate programs (or code sequences) from the discovery rules, and there is no particular relationship between the discovery agents and the discovery rules"), and themselves fall into the category of subject matter the Supreme Court declared patent ineligible in Benson and Flook. See Benson, 409 U.S. at 67 (mathematical formula, which could be performed either by the human mind or by a computer, was drawn to patent-ineligible subject matter because it attempted to patent one of the "basic tools of scientific and technological work."); Flook, 437 U.S. at 586 (holding patent claiming "a formula for computing an updated alarm limit" during catalytic conversion processes in the petrochemical and oil refining industries is not patent eligible). Indeed, there is not even a limit on the number of mathematical formulas claimed in the '581 Patent. Moreover, using the data gathered to trigger some type of system response is the same type of "post-solution activity" rejected in Flook as insufficient to transform the idea into patent-eligible subject matter. 437 U.S. at 590.

IV points to language contained in the Patent's specification and figures in an effort to salvage the Patent, arguing that terms like "modules" and "discovery engine" are "specific computer process[es]." Dkt. No. 14-220, ECF No. 52, at 20 (a "discovery engine" apparently connects discovery agents to discovery rules and "modules" are "specific computer programs which reside within the discovery engine" and perform various functions). But these terms do not save the Patent for two reasons: first, because they also do not appear to be any more limited

in scope than terms such as "discovery agent" and "discovery rule"; second, they are not referenced anywhere inside the Patent claims themselves, but are only included in the specification. It is the Patent claims which must contain sufficient limitations to provide an inventive concept to an abstract idea, and while the specification may be useful in informing a court's understanding of the claims, *see Internet Patents Corp.*, 2015 WL 3852975, at *5 (using specification to determine that terms were conventional); *BASCOM*, 2015 WL 2341074, at *15 (using specification to conclude that "filtering schemes are merely 'any type of code which may be executed."), the Court may not import details from the specification and then call them limitations on the claims, *see Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1334 (Fed. Cir. 2012) ("In considering patent eligibility under § 101, one must focus on the claims. This is because a claim may 'preempt' only that which the claims encompass, not what is disclosed but left unclaimed.").

The '581 Patent lays out a broad method, and in doing so, it claims and thus seeks to preempt the other use of nearly any code sequence or mathematical equation transmitted over any communication network and applied to any data set to trigger pretty much any response. While the '581 Patent states that one example of a "particular discovery rule" in action would be to "generate a warning to the user . . . if the available disk space or available memory falls below a particular threshold," '581 Patent, at 4:63–67, that is only one particular action that could be performed by one particular discovery rule—and there are a seemingly infinite (or perhaps at least a really enormous and wholly undetermined and undeterminable) number of others also encompassed in the claim language, and each is merely transmitted, applied to data, and sent back across the communication link. *Cf. Intellectual Ventures II LLC v. JP Morgan Chase & Co.*, No. 13-3777, 2015 WL 1941331, at *13 (S.D.N.Y. Apr. 28, 2015) (explaining a patent's

preemptive effect and pointing out that "[t]he claims apply to the application of *any* pre-selected access rule" and are "executable on virtually *any* digital device") (emphasis in original).

Where the claims are so "exceptionally broad and the computer implementation limitations do so little to limit their scope," they are simply not patent eligible. OIP Techs., Inc. v. Amazon.com, Inc., 788 F.3d 1359, 1363 (Fed. Cir. June 11, 2015) ("Indeed, the specification makes clear that this "programming" and the related computer hardware "refers to any sequence of instructions designed for execution on a computer system."); see also Affinity Labs of Texas, LLC v. DirecTV, LLC, F. Supp. 3d __, No. 15-0030, 2015 WL 3764356, at *27 (W.D. Tex. July 7, 2015) (concluding the patent at issue monopolized "the dissemination of regionally broadcasted content to a user outside the region on an electronic device that utilizes cellular communication" partially because of "the scope of the definition in the specification"). And again, the inclusion in some of the claims of "a computer-readable medium", '581 Patent, at Claim 29, also does not change the analysis. OIP Techs., 788 F.3d at 1363 (holding patentineligible claims which included "storing test results in a 'machine-readable medium," because that and other limitations only "require[ed] conventional computer activities or routine datagathering steps" which did not transform the abstract idea of "offer-based price optimization" into an inventive concept); Internet Patents Corp. v. Active Network, Inc., 790 F.3d. 1343, 1348—49 (Fed. Cir. 2015) ("The statement that the method is performed by computer [for a claim using a "computer-readable storage medium"] does not satisfy the test of 'inventive concept.' (internal citation omitted)); CyberSource Corp. v. Retail Decisions, Inc., 654 F.3d 1366, 1374 (Fed. Cir. 2011) ("CyberSource contends that, by definition, a tangible, man-made article of manufacture such as a 'computer readable medium containing program instructions' cannot possibly fall within any of the three patent-eligibility exceptions We disagree.").

Prior to oral argument, IV filed a supplemental brief addressing what it says are the implications of the Federal Circuit's decision in *DDR*. Dkt. No. 14-220, ECF No. 55.⁶⁴ Plaintiffs argue that the *DDR* Court held the claims patent eligible under both prongs of the *Alice* test: those claims were not directed to abstract ideas, and even if so, they contained sufficient limitations to transform them into patent-eligible subject matter. *Id.* at 4–5. IV sought to illustrate the similarities between their Patents and the claims at issue in *DDR* during oral argument. Its counsel focused specifically on the assertion that the '581 Patent solved "software problems," including the time consuming nature of making changes to built-in diagnostic routines in software, and the previously non-automated manner in which the applications ran. Dkt. No. 14-220, ECF Nos. 97, at 102:1–23; 91, at 9–11.

As a preliminary matter, the Court disagrees with IV's reading of the Federal Circuit's opinion in *DDR*. Although Plaintiffs assert that the court there held the claims at issue were not drawn to an abstract idea, *see* Dkt. No. 14-220, ECF No. 55, at 4 ("[T]he Court held that the challenged claims were not directed to an abstract idea."), this Court sees no such holding in the opinion. Instead, the Federal Circuit discussed general categories of abstract ideas, noted that the claims at issue presented challenges in "identifying the precise nature of the abstract idea," and then ultimately declined to address *Alice* Step One, concluding that "under any of these

⁶⁴ Plaintiffs' brief was not limited to discussion of the '581 Patent but argued that *DDR* similarly applies to the '434 and '002 Patents as well.

⁶⁵ To the extent the Federal Circuit addressed the patent with regard to *Alice* Step One, it merely explained that it did not fall within certain categories of abstract ideas such as "longstanding commercial practice[s]" or "mathematical algorithm[s]." *DDR Holdings*, 773 F.3d at 1257; *see BASCOM*, 2015 WL 2341074, at *11 ("[T]o the extent the *DDR Holdings* court analyzed whether the subject claims were directed toward an abstract idea, it did so by exclusion."). This definition by exclusion is only of limited help when comparing it to other patents, when the Court did not go so far as to say the patent was not directed to an abstract idea. The Court recognizes that "[d]istrict courts have disagreed as to whether *DDR Holdings* should be read as having concluded that the claim at issue there was not directed to an abstract idea under step one of *Alice*, or whether the decision was solely intended to convey that, pursuant to step two of *Alice*, the claim amounted to a patent-eligible application of an abstract idea." *Execware*, *LLC v. BJ's Wholesale Club, Inc.*, No. 14-233, 2015 WL 4275314, at *10 n.14 (D. Del. July 15, 2015) (collecting cases on each side of the debate).

characterizations of the abstract idea, the '399 patent's claims satisfy *Mayo/Alice* step two." *DDR Holdings*, 773 F.3d at 1257; *see also BASCOM Global Internet Servs., Inc. v. AT & T Mobility LLC*, __ F. Supp. 3d __, No. 3:14-CV-3942-M, 2015 WL 2341074, at *11 (N.D. Tex. May 15, 2015) ("[T]he Federal Circuit did not decide in *DDR Holdings* whether the composite web page at issue was directed toward an abstract idea.").

That said, DDR offers guidance with regard to Alice Step Two. The Federal Circuit upheld the claims under § 101 because they "claimed [a] solution [that] is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks." DDR Holdings, 773 F.3d at 1257. Not only that, but the claims also "specify how interactions with the Internet are manipulated to yield a desired result—a result that overrides the routine and conventional sequence of events ordinarily triggered by the click of a hyperlink." Id. at 1258. Another district court within this Circuit has interpreted these requirements as calling for an inquiry into whether "the invention of . . . certain computer technology created the problem at hand [and] [i]f the court can point to a brick and mortar analog to the problem at issue, the computerized solution will not suffice to make the patent eligible under § 101." Source Search Techs., LLC v. Kayak Software Corp., F. Supp. 3d ___, No. 11-3388, 2015 WL 3980628, at *7 (D.N.J. July 1, 2015). The same court also stated that "DDR Holdings tells us that when a patent holder seeking to establish § 101 eligibility for an otherwise abstract idea points to a particular element of a patent's claims as solving a computer-centric problem, the claims must specify how that solution works. That specificity removes the claims from the abstract realm." Id. at *12 (emphasis in original).

Although IV attempts to point out specific "software problems" addressed by the '581 Patent, that argument alone is insufficient to hold a claim patent eligible. *See BASCOM*, 2015

WL 2341074, at *2 (holding patent-ineligible claims for an "invention designed to overcome the disadvantages in the single-user, local server-based, and server-based configurations by providing individualized, customizable filtering and data storage on the ISP server"). Patent claims cannot simply address a problem on a computer, but must somehow change or improve the computer itself, Alice, 134 S. Ct. at 2359, without also claiming too much and thus preempting use of the abstract idea, Enfish, 56 F. Supp. 3d at 1174-75 ("Patents that claim inventions too broadly or prohibit a vast amount of future applications are suspect." (citing Benson, 409 U.S. at 68; O'Reilly v. Morse, 56 U.S. 62, 113 (1853))). As the court cautioned in DDR, "not all claims purporting to address Internet-centric challenges are eligible for patent." 773 F.3d at 1258. The '581 Patent is not some "combination of conventional elements [which together] may be unconventional and therefore patentable," Enfish, 56 F. Supp. 3d at 1175 (citing Diehr, 450 U.S. at 188), but is instead a combination of conventional elements that are wholly unlimited in their application. Claims of this nature must "specify how [a] solution" to a computer-centric problem works in order to remove it from the abstract realm. Source Search Techs., 2015 WL 3980628, at *12.

Finally, IV's own characterization of Claim 1 of the '581 Patent states that it "claims a method transmitting a 'discovery rule,' a specific computer process, across a communication link in a computer system to collect information about the computer system." Dkt. No. 14-220, ECF No. 52, at 20. That said, the claim, even as defined by Plaintiffs, describes an abstract idea with insufficient limitations that would amount to less than claiming the abstract idea itself. To explain why, the Court will address with brackets where and how the limitations fail in order to illustrate this conclusion: IV claims a "a method transmitting a discovery rule, a specific computer process [but not just one specific computer process, rather any discovery rule, which is

defined in the Patent as "a series of Boolean operations, mathematical equations, or other comparisons or evaluations of the collected data"; anything matching the definition counts, according to the Patent, and is therefore claimed as part of the method], across a communication link in a computer system [and again, any communication link will do], to collect information about the computer system [there is similarly no limit on the type of information that could be collected]."

This claim is impossibly broad, and illustrates the lack of limitations which could render the otherwise patent ineligible abstract idea viable under § 101, and other claims including the use of a "discovery agent" or a "computer-readable medium" similarly fail to add any inventive step that would make them patent eligible. In short, Claim 1 "states that 'the discovery rule is to be applied to data' so as 'to generate information,' but does not indicate how the rule is applied or how data is generated, and in what form." Dkt. No. 14-220, ECF No. 58, at 17 n.8.

The '581 Patent is drawn to the abstract idea of gathering, storing, and acting on data based on predetermined rules, and its claims⁶⁷ for doing so on generic computers and networks

⁶⁶ The Court also concludes that IV's reliance on *Aristocrat Techs. Austral. Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008) is misplaced. Plaintiffs cite that case for the proposition that "a 'general purpose computer' that executes particular software instructions creates a 'special purpose machine' programmed to carry out the instructions." Dkt. No. 14-220, ECF No. 52, at 21. However, IV omits a key statement contained in the Federal Circuit's § 112 (*not* § 101) analysis, that the "special purpose machine" is created once it is "programmed to carry out a *particular* algorithm." *Aristocrat*, 521 F.3d at 1333 (emphasis added).

Unlike the "particular," "disclosed" algorithms summarized by the Federal Circuit, *id.*, one of the primary *Alice* problems with the '581 Patent is the limitless nature of the term "discovery rules," which according to the Patent covers a broad swath of possibilities, as discovery rules "may be a series of Boolean operations, mathematical equations, or other comparisons or evaluations of the collected data," '581 Patent, at 3:19–22.

Akin to other claims held patent ineligible, the '581 Patent "expressly disavows any requirement for specific programming or architecture." *Mkt. Track, LLC v. Efficient Collaborative Retail Mktg., LLC*, No. 14-4957, 2015 WL 3637740, at *9 (N.D. Ill. June 11, 2015); *see also Thales Visionix, Inc. v. United States*, 122 Fed. Cl. 245, 256 (Fed. Cl. 2015) (MOT test failed because "transforming data from one form to another does not qualify as the kind of transformation regarded as an important indicator of patent eligibility" (internal quotation marks and citation omitted)).

⁶⁷ This Court's review and consideration of various dependent claims of the representative claims of the '581 Patent do not alter the conclusion that they are each not patent eligible under § 101. Apart from the reality that it is the

using mathematical formulas and code sequences do not transform it into patent-eligible subject matter.

G. The '434 Patent

1. Claims and Description of the '434 Patent

The '434 Patent, entitled "System and Method for Retrieving Information from a Database Using an Index of XML Tags and Metafiles," includes the following representative claims:

1. A method for creating a database and an index to search the database, comprising the steps of:

creating the index by defining a plurality of XML tags including domain tags and category tags; creating a first metafile that corresponds to a first domain tag; and

creating a first metafile that corresponds to a first domain tag; and creating the database by providing a plurality of records, each record having an XML index component.

7. A method for searching a database of records using an index including a plurality of tags, comprising the steps of:

receiving a request for information;

identifying a first tag that is associated with the request;

determining whether a first metafile comprising a second tag corresponds to the first tag;

if the first metafile corresponds to the first tag, then determining whether the second tag is relevant to the request;

if the second tag is relevant to the request, then combining the first tag and the second tag to create a key; and

using the key to search the database to locate at least one record that includes the first tag and the second tag.

This Patent is generally drawn to methods for creating a database using tags to identify various records and then for searching that database. Claims 1 through 6, as well as Claim 25, deal with methods for creating a database and index, while all others deal with methods of searching the database using the index. The Court concludes that Claims 1 and 7 are

obligation of the Plaintiff to demonstrate how and why that would be the case, the dependent claims do not narrow or limit the impermissible breadth of the independent claims, nor do they alter their essential scope.

"substantially similar and linked to the same abstract idea" as the other claims in the Patent, and thus will assess them as representative. *Content Extraction*, 776 F.3d at 1348; *Ultramercial*, 772 F.3d at 712. Distinctions in the other independent claims are immaterial, and for the reasons noted above, consideration of the dependent claims does not alter that conclusion.⁶⁸

2. Analysis of the '434 Patent

Claim 1 generally recites a method for creating a database and an index to search that database. It specifically claims the method of (1) creating an index by picking some number of XML tags "including domain tags and category tags;" (2) creating a metafile, or essentially adding additional identifying information onto the tags; and (3) creating a database by compiling some number of records, which can relate back to the index.

Claim 7 generally recites a method for searching a database created with the help of an index and tags. The method claims (1) receiving a request for information; (2) identifying a tag, or some proxy for the information associated with that request; (3) determining whether any other tags are also associated with the request, or whether the request could fall into multiple categories; (4) if multiple tags or other specific information are relevant, combining them; and (5) using the combination to search the database for a record.

Addressing *Alice* Step One on whether the claims are directed to an abstract idea the Court asks, "[W]hat are the claims generally trying to achieve?" *Tranxition*, 2015 WL 4203469, at *6. The Erie and Highmark Defendants argue that they merely claim "the abstract idea of creating an index and using it to search a database," Dkt. No. 14-220, ECF No. 47, at 21, and the Old Republic Defendants similarly assert that they claim the idea of "[s]earching for information stored in a database by searching for a combination of 'tags' that serve as a proxy for the

⁶⁸ For instance, Claim 14 is largely similar to Claim 7 except that it also recites "[a] computer-readable medium having stored thereon computer-executable instructions for" performing a slightly altered version of the method in Claim 7.

information," Dkt. No. 14-1130, ECF No. 31, at 5. IV counters that the '434 Patent is directed to a "specific computer solution [rather than an abstract idea], namely retrieving computer files from a computer database system by utilizing an index file that contains specific metadata linked to those files and transforming that data to create a unique key." Dkt. No. 14-220, ECF No. 52, at 23 (citing '434 Patent, Abstract).

But even when framed as a "computer solution" employed on a "computer database system," the Court concludes that the heart of the patented invention, or the true nature of the claims, are indeed drawn to an abstract idea. *Alice*, 134 S. Ct. at 2355–57; *Ultramercial*, 772 F.3d at 714; *Accenture*, 728 F.3d at 1344. The idea in this instance is that of creating an index and using that index to search for and retrieve data. This type of activity is undoubtedly longstanding and can be easily analogized to a great deal of conduct taking place before computers or the Internet even existed. In that vein, the Old Republic Defendants specifically analogize the claims at issue to the same process by which one searches for a book in a library using 'tags' as proxies for book titles and authors, identifying specifically the Library of Congress's classification system as one very similar "brick and mortar" analogue. Dkt. No. 14-1130, ECF No. 31, at 5–6; 14.69

IV says that there are in fact additional features which limit the claims (somewhat), *see* Dkt. No. 14-220, ECF No. 52, at 23 ("[M]ost of the claims contain[] elements limited to XML databases, which are specialized computer database systems." (citing '434 Patent, at Claims 1–6; Claims 19–26)), but the Court should address these purported limitations at Step Two to determine if they supply any inventive concept. Those limitations do not make the underlying

⁶⁹ The Court declines to take judicial notice of any documents attached to further explain the Library of Congress's system, as requested by the Old Republic Defendants. Dkt. No. 14-1130, ECF No. 33. There is no need to review such information when any system of organization that uses tags and searches and implements steps on computer would likely be covered under this Patent.

purpose, or heart of the '434 Patent's claims, any less abstract. *Ultramercial*, 772 F.3d at 714; *Accenture*, 728 F.3d at 1344.

At bottom, these claims are directed to creating an index and using it to search for and retrieve data, which numerous courts have held to be an abstract idea. *See, e.g., Cyberfone*, 558 F. App'x at 992 ("[U]sing categories to organize, store, and transmit information is [an abstract idea]."); *Mkt. Track*, 2015 WL 3637740, at *3 (holding ineligible a patent that read stored data, recognized information within that data, and presented the information in a format which humans could read); *Data Distribution Techs., LLC v. BRER Affiliates, Inc.*, No. 12-4878, 2014 WL 4162765, at *2 (D.N.J. Aug. 19, 2014) (holding a "method of maintaining and distributing database information" "directed to an abstract idea").

The steps of Claim 1 (and Claims 2–6) go to the "creating an index" portion of the idea: XML tags are designated (and "XML tags" are nothing more than "patent-ese" for an information identifier, *see* '434 Patent, at 7:20–22 ("A tag is generally associated with data or text and conveys information about the data or text."), written in a commonly-used programming language, "eXtensible Markup Language," *id.*, Abstract), a "metafile" is created (a metafile "is associated with a tag and provides additional information about the data or text described by the tag," *id.* at 7:22–24), and a database is created and the information sought has its own "XML index component" (an "index is essentially a guide that is used to locate information stored in a database," *id.* at 2:39–41). These steps can be boiled down to (1) identifying categories that will be used to search; (2) adding sub-categories, or further detail to those categories; and (3) placing records or information that can be identified by those categories into a database.

⁷⁰ "[C]ourts must be careful to avoid allowing the typically convoluted claim language—"patent-ese"—to obfuscate the general purpose and real essence of software patent claims." *In Re TLI Comms. LLC Patent Litigation*, __ F. Supp. 3d __, No. 14-2534, 2015 WL 627858, at *6 (E.D. Va. Feb. 6, 2015).

The steps of Claim 7 are directed to using the index to search for and retrieve information, but are similarly abstract in their explanation. When the patent-ese is stripped away, Claim 7 simply recites the method of (1) receiving a request; (2) identifying the request's relevant category; (3) determining if a subcategory applies; (4) if it does, then determining if another category is also relevant; (5) if a second category is relevant, combine both categories to create one search; and (6) using that single search to find one or more records that fit both categories.

This method, of searching a database and retrieving information, claims an abstract idea. *Content Extraction*, 776 F.3d at 1347 ("The concept of data collection, recognition, and storage is undisputedly well-known. Indeed, humans have always performed these functions."); *Tranxition*, 2015 WL 4203469, at *9 (citing *Cyberfone Sys.*, 558 F. App'x at 992 ("the well-known concept of categorical data storage, *i.e.*, the idea of collecting information in classified form, then separating and transmitting that information according to its classification, is an abstract idea that is not patent-eligible."); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1375 (Fed. Cir. 2011) (holding that the claimed process to "manipulate[] data to organize it in a logical way" was not sufficiently transformative to state a patent eligible invention)). When nothing in the claims removes the underlying purpose of the Patent from the abstract realm, the Court concludes that the answer at *Alice* Step One is "yes."

Turning to *Alice* Step Two, the Court again "considers the elements of each claim both individually and as an ordered combination" to determine whether they present an "inventive concept" that transforms the claim's abstract nature into something "significantly more than a patent upon the ineligible concept itself." *Alice*, 134 S. Ct. at 2355 (citing *Mayo*, 132 S. Ct. 1289 (internal quotation marks omitted). Incorporation of typical computer components won't cut it,

as the Supreme Court has counseled that the second step requires more than merely stating the abstract idea and applying it on a general computer. *Id.* at 2357. As instructed by the Supreme Court and Federal Circuit, the Court is at this stage especially wary of broad claims that would preempt too much use of the abstract idea.

The Erie and Highmark Defendants argue that the '434 Patent fails this test because the abstract idea's implementation on a generic computer using XML tags is not inventive, nor does it purport to improve the underlying technology, but rather uses "a combination of well-known and conventional components already present in 'most conventional computer systems.'" ECF No. 47, at 23 & n.10 (quoting '434 Patent, at 5:61–64). The Old Republic Defendants add that the claims are incredibly broad, and the Patent's "preference for implementation on a conventional computer" along with limitations including a "computer-readable medium" do nothing to render it significantly more than a patent on the abstract idea itself. Dkt. No. 14-1130, ECF No. 31, at 14–15.

IV counters that Defendants ignore concrete claim limitations which satisfy the machine-or-transformation test, and attempts to distinguish its '434 Patent from that at issue in cases like *Accenture*, arguing that this invention "is a new database architecture that employs inventive computer software and data structures." Dkt. No. 14-220, ECF No. 52, at 24. IV also argues that the XML-based database system adds a meaningful limitation in that it shows "the claims do not preempt all uses or organizing information in a database." *Id.* at 25.

The claims of the '434 Patent, considered both individually and as an ordered combination, fail to provide an additional feature that would transform the abstract idea of creating an index and using that index to search for and retrieve data into patent eligible subject matter. Indeed, the Court concludes from reviewing the claims that the Patent includes little

more than the abstract idea itself, and to the extent there are additional limitations, they are "little more than synonyms for generic conventional computer processing steps," *Tranxition*, 2015 WL 4203469, at *12, which are insufficient to convey an inventive concept under *Alice* and *Mayo*. A database is a typical data-storage component of a generic computer, and the ability of a computer to index and search a database according to identifiers such as XML tags is simply not inventive, *cf. Ultramercial*, 772 F.3d at 717 (explaining that "the transfer of content between computers is merely what computers do" and does not render claims patent eligible).

That the database uses XML as opposed to a different programming language is insufficient to limit the Patent's reach, as that only narrows down the possibility of preemption to methods of creating and searching a computer database using one entire language—and the '434 Patent in fact seeks to claim more, as the "XML" limitation is not included in every claim, *see* '434 Patent, at Claims 7–18; 27–28, and the Patent explains that "[a]lthough the present invention has been described in connection with the XML language, those skilled in the art will realize that the invention can also be practiced using other languages that use tags and support the association of a file, such as a metafile with a tag," *id.* at 15:19–23, to wit, pretty much any language, and largely any/every computer.

Of course, there is an argument that the '434 Patent claims computer-specific solutions to problems of slow and inefficient searches of databases, in that it seeks to "eliminate the need to conduct multiple searches" or "maintain multiple databases" by implementing a "universal search vocabulary" that efficiently retrieves search results for users without returning too much irrelevant information. *See* '434 Patent, at 2:11–12; 22–23. But unlike the claims at issue in *DDR*, upon which IV relies, efficiently searching for information is not a solution that "is

necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks." *DDR Holdings*, 773 F.3d at 1257.

The need and desire to efficiently search for records and obtain only the most relevant ones are not made any less abstract when claims that purport to do so are implemented on a computer database. There are manual processes that could achieve the same result—the fact that they would be slower and less accurate does not change the analysis. OIP Techs., Inc. v. Amazon.com, Inc., 788 F.3d 1359, at *3 (Fed. Cir. 2015) ("[R]elying on a computer to perform routine tasks more quickly or more accurately is insufficient to render a claim patent eligible."); Capital One, 2015 WL 4068798, at *3 ("Nor, in addressing the second step of Alice, does claiming the improved speed or efficiency inherent with applying the abstract idea on a computer provide a sufficient inventive concept."); MySpace, Inc. v. GraphOn Corp., 672 F.3d 1250, 1267 (Fed. Cir. 2012) ("While running a particular process on a computer undeniably improves efficiency and accuracy, cloaking an otherwise abstract idea in the guise of a computerimplemented claim is insufficient to bring it within section 101.") (Mayer, J., dissenting from the majority's disposition of the case on obviousness and anticipation grounds instead of under § 101) (collecting cases). The "brick and mortar" analog of searching for a library book using an index and various categories shows the idea's abstract nature, Source Search Techs., LLC v. Kayak Software Corp., __ F. Supp. 3d __, No. 11-3388, 2015 WL 3980628, at *7 (D.N.J. July 1, 2015), and specifying generic computer components and processes like "tags," "metafiles," and a "database" do very little to narrow the concept. See Capital One, 2015 WL 4068798, at *6 ("Requiring the use of a 'software' 'brain' 'tasked with tailoring information and providing it to the user' provides no additional limitation beyond applying an abstract idea, restricted to the Internet, on a generic computer.").

That the Patent claims a method in reaction to the huge amount of information stored and searched in today's world similarly does not make the claims patent eligible. See MicroStrategy Inc., 2015 WL 4425828, at *4 ("The amount of data does not transform the abstract idea. It has been noted that 'data storage is perhaps the textbook example of a conventional computer function." (internal citation omitted)). This conclusion is especially true when "an exemplary computer system for implementing the present invention includes a conventional computer," '434 Patent, at 5:5–6 (emphasis added), and does not even require the use of certain limitations, such as XML and metafiles. See e.g., '434 Patent, at Claims 7–18; 27–28 (claims not including XML limitation); id. at 9:22–24 ("Although each XML tag can have an associated metafile, in some implementations there may be XML tags that do not have associated metafiles."). Even assuming these limitations existed in each and every claim, they are no more than "conventional computer components" and are insufficient to confer patent eligibility. Additionally, steps such as receiving a request for information and identifying a tag, then using a key to search the database are "routine, conventional processing steps that any generic computer can perform, and are not, therefore, an inventive concept." Tranxition, 2015 WL 4203469, at *16 (holding patent ineligible a method for transferring customized user settings from and old computer to a new one).

The claims in the '434 Patent are stated at such a high level of generality that the Court has difficulty contemplating any methods of creating an index and using that index to search for and retrieve data on a computer database that would not be preempted by them. It certainly seeks to preempt use of XML tags to create and then search a database on a generic computer, but then also is not limited to using XML tags. Claim 7, which is representative of the searching portion of the Patent, identifies steps that do no more than identify a request for information,

narrow the request down to a category (and subcategory if necessary) and then search to locate results. The potential preemptive effect of such claims is extreme, and limitations are lacking which could avoid "preempt[ing] use of this approach in all fields" in order to confer patent eligibility. *Alice*, 134 S. Ct. at 2354.⁷¹

The Court concludes that the '434 Patent is directed to an abstract idea and that it does not contain a sufficient inventive concept to remove it from the abstract realm and render it patent eligible under § 101. Defendants' Motions to Dismiss on those grounds will therefore be granted.⁷²

H. The '002 Patent

1. Claims and Description of the '002 Patent

The '002 Patent, entitled "System and Method for Implementing an Intelligent and Mobile Menu-Interface Agent" includes the following representative claim:

1. A method for retrieving user specific resources and information stored either on a local device or a network server, the method comprising the steps of: retrieving a mobile interface from the network server to the local device; displaying the mobile interface on the local device, the mobile interface including a plurality of pointers corresponding to the user specific resources and information; and retrieving the user specific resources and information using the plurality of pointers displayed on the mobile interface.

The '002 Patent claims an invention for "dynamically access[ing] programs, applications, bookmarked URLs, IP addresses, telephone numbers, television channels, radio stations, user profiles, and the like that are specific to a user via any computer type device." '002 Patent,

And the Court's consideration of the dependent claims demonstrates that they do not save the day, as they do not diminish the abstract nature of what is claimed, nor do they generate the requisite inventive concept to make the Patent "patent eligible" under § 101.

⁷² Because the Court concludes that both the '581 Patent and the '434 Patent are not directed to patent eligible subject matter, the Court does not address the portions of the Erie and Highmark Defendants' Motions arguing that IV's infringement claims should be dismissed for failure to set forth sufficient facts to state a claim, or alternatively that this Court should compel IV to provide a more definite statement. Dkt. No. 14-220, ECF No. 47, at 26–32.

Abstract. The method claimed is that for accessing a mobile interface that incorporates pointers tied to user specific information that can be retrieved using pointers contained in the interface. Id. at Claim 1. Dependent Claims 2-5 explain what types of user-specific information can be accessed and is drafted broadly, ranging from "programs, applications, files, documents, bookmarked URLs, and user profiles" to "television channels" to "telephone numbers" to "television program listings." Claim 6 contains an added "step of licensing the user specific resources based on a per user licensing model." Dependent Claims 7–10 contemplate the way in which the mobile interface agent is accessed—through the Internet, a LAN, MAN, or WAN, a cellular network, or a television network (e.g., pretty much anything). These generic dependent claims are then repeated at various times throughout the Patent. See, e.g., Claims 26–33; 35–39; 41-46. The remaining independent claims are "substantially similar and linked" to the same underlying idea as that of the representative claim. Content Extraction, 776 F.3d at 1348; Ultramercial, 772 F.3d at 712. For instance, Claim 11 only varies from Claim 1 in that it claims "retrieving user profile and configuration data from the network server to the local device, wherein the . . . data is used to update the data associated with the mobile interface" in addition to the rest of Claim 1. This addition does not meaningfully distinguish Claim 11 from Claim 1. Remaining independent claims, including the system claims, are similarly all directed to the same underlying idea and thus may be assessed using the representative claim noted above.

2. Analysis of the '002 Patent

Claim 1 recites a method for accessing user specific information that is stored either on a device or on a network server. The claimed method is comprised of (1) retrieving a mobile interface (stored on a network server); (2) displaying the mobile interface, which includes

pointers to the user specific information, on some local device; and (3) retrieving, or accessing, user specific information using pointers on the interface.

The Court concludes that the '002 Patent as a whole claims the abstract idea of remotely accessing user specific information. At bottom, courts are to get to the heart of the patent, *Alice*, 134 S. Ct. at 2355–57; *Ultramercial*, 772 F.3d at 714; *Accenture*, 728 F.3d at 1344, and not be held up by inclusion of only theoretically limiting components of the claims. Just as the Supreme Court disregarded, for the sake of the *Alice* Step One analysis, asserted limitations such as correlation of a shadow credit record and shadow debt record to hold claims together were directed to the abstract idea of "intermediated settlement," the Court disregards at this step the use of limitations such as a "mobile interface," which do not alter the abstract nature of the Patent's claims for remotely accessing user specific information. *Alice*, 134 S. Ct. at 2352 n.2, 2356; *see also Ultramercial*, 772 F.3d at 715 (concluding that "the concept embodied by the majority of the limitations describes only the abstract idea of showing an advertisement before delivering free content" although the claims included other limitations).

The Court will assess the use of the "mobile interface" and other limitations claimed in the Patent on *Alice* Step Two, but at *Alice* Step One the '002 Patent is directed to an abstraction. That it is not directed to a mathematical equation or commercial practice does not make the concept of remote access to a user's stored information any more concrete. *See Accenture*, 728 F.3d at 1344–45 (holding patent ineligible claims directed to the idea of "generating tasks [based on] rules . . . to be completed upon the occurrence of an event."); *Content Extraction*, 776 F.3d at 1347 (holding patent ineligible claims directed to "data collection, recognition, and storage").

At the most basic level, the Court concludes that the claims at issue can be loosely analogized to calling a person from one location in order to obtain information located in another

place; this type of interaction amounts to a general "method of organizing human activity." *Alice*, 134 S. Ct. at 2356; *Capital One*, 792 F.3d at 1367. While that analogy is a simplification given that the '002 Patent contains limitations taking it out of that very traditional "brick and mortar" realm, the analysis in determining whether the included limitations sufficiently convert the abstract idea into patent eligible subject matter is best handled at *Alice* Step Two.

Another district court came to this conclusion in addressing the '002 Patent. See Intellectual Ventures I LLC v. Capital One Financial Corp., No. 14-111, 2015 WL 5165442 (D. Md. Sept. 2, 2015) (rejecting the Report and Recommendation of a Special Master and concluding the '002 Patent claimed ineligible subject matter). That court held the '002 Patent was "directed to the abstract idea of retrieving data located in another place by using a device with information that pinpoints the data's location to facilitate its retrieval." Id. at *20. This Court agrees that recitation of a mobile interface does not change this analysis, and that indeed, Alice Step One is not the proper place to consider it. Id. The proper inquiry is not to hone in on various limitations and perhaps hold the underlying concept less abstract because those limitations are integral aspects or because features in the claim language. The test at Alice Step One is to determine whether the idea at the core of a patent is abstract vel non, since at Alice Step One, the Court is to consider the claims "on their face." Id. Remotely accessing user-specific information is just such an idea. Cf. Internet Patents Corp. v. Active Network, Inc., 790 F.3d 1343, 1348 (Fed. Cir. 2015) ("We agree with the district court that the character of the claimed invention is an abstract idea: the idea of retaining information in the navigation of online forms."). Thus, the Court will move on to *Alice* Step Two.

Alice Step Two requires courts to assess whether each claim's elements, considered "both individually and as an ordered combination," present an "inventive concept" that shows the

claims are "significantly more than a patent upon the ineligible concept itself." *Alice*, 134 S. Ct. at 2355 (citing *Mayo*, 132 S. Ct. at 1294) (internal quotation marks omitted). The possibility that the patent will "tie up too much future use" of the abstract idea is an important concern addressed at Step Two. *Mayo*, 132 S. Ct. at 1302.

In reviewing the claims of the '002 Patent, the Court concludes that they lack the requisite inventive concept that would transform the abstract idea of remotely accessing userspecific information into patent eligible subject matter. Most specifically, use of a "mobile interface" does not change the conclusion that the idea underlying the Patent as a whole is abstract and does not provide an inventive concept. As other courts have recognized, "concrete and tangible elements such as computers, portable devices, and a mobile interface" do not render the claims any less abstract. Affinity Labs of Texas, LLC v. Amazon. Com, Inc., No. 15-0029, 2015 WL 3757497, at *7—*8 (W.D. Tex. June 12, 2015) (Report & Recommendation) (emphasis added) (holding claims directed to "delivering selectable media content and subsequently playing the selected content on a portable device" patent ineligible). Indeed, in another recently-decided case (involving IV as the plaintiff), the Federal Circuit rejected the argument that an "interactive interface' is a specific application of an abstract idea that provides an inventive concept," explaining that where IV did not "assert that it invented an interactive interface that manages web site content" and otherwise described it in "vague and generic" terms, the interface was nothing more than a "generic web server with attendant software, tasked with providing web pages to and communicating with the user's computer." Intellectual Ventures I LLC v. Capital One Bank (USA), 792 F.3d 1363, 1370 (Fed. Cir. 2015). Similarly, IV does not claim that it invented a specific mobile interface, and instead only claims "a system and method for using" one. Id. (where IV did not claim to have invented an interactive interface, use of that interface could not convert the claims which were otherwise directed to an abstract idea to patent eligible subject matter).

Apart from the mobile interface, which on its own is not inventive, the Court concludes that limitations such as a "local device," a "network server," and "pointers" are similarly conventional and well-known computer technology. *See* '002 Patent, at 1:36–41 (defining a "pointer" as a "reference to a type of menu item that can be accessible on the computer, [portable digital assistant], or a server" and stating that "pointers are commonly used to retrieve/access menu items."). That the mobile interface can be retrieved and used "via the Internet," "via a cellular network," "via a television network," or by commonly used networks does not change the analysis. *Id.* at Claims 7, 9, 10. "[E]xporting user profile and configuration data from a first network to a second network" also fails to provide an inventive concept. *See buySAFE*, 765 F.3d at 1355 (explaining that "sending" and "receiving" data over a network is "not even arguably inventive"). While IV generally maintains that "[m]any dependent claims further limit both the type of data that the mobile interface agent can access and the type of computer systems upon which the mobile interface operates," Dkt. No. 14-220, ECF No. 52, at 27, the Court divines no such limitations from the language of the claims themselves.

Considering the issue of preemption, the '002 Patent explicitly states that it governs "dynamic access" to a broad swath of information "via *any* computer *type* device." '002 Patent, Abstract (emphasis added). As the Old Republic Defendants point out, the '002 Patent states that there are "countless uses of the present invention," and the Patent specifically enumerates broad categories of covered usage from "conduct[ing] online financial transactions more efficiently" to "us[ing] the user profile on the network for online advertising or promotional services." *Id.* at 8:7–13; Dkt. No. 14-1130, ECF No. 31, at 16. The claims do not lend

themselves, either individually or as an ordered combination, to concluding that the invention would not preclude any attempt to design another invention for remote access to user-specific information using any one of an infinite number of devices. They point in the opposite direction.

A desire to remotely access user-specific information also is not a problem arising only in the computer context. As noted above, the abstract idea underlying the '002 Patent existed long before computer technology existed and has analogues in the brick and mortar context—it therefore does not contain the type of claims held patent eligible in *DDR Holdings*, 773 F.3d at 1257. Even if it did address a problem "rooted in computer technology," *id.*, its claims would need to specify "how that solution works," *Source Search Techs.*, 2015 WL 3980628, at *12. Claiming systems and methods that involve nothing more than (1) "retrieving a mobile interface from a network server to the local device"; (2) displaying the interface on the device and including pointers which correspond to user preferences; and (3) retrieving that user-specific information "using a plurality of pointers," which are themselves commonly used, threatens to preempt too much and simply does not provide the type of inventive concept necessary to render the claims patent eligible under § 101.

The Court concludes that the claims of the '002 Patent are directed to patent ineligible subject matter. The Old Republic Defendants' Motion to Dismiss claims relating to that Patent will therefore be granted.⁷³

⁷³ This means that IV's claims relying on the '002 Patent as to the Erie and Highmark Defendants would similarly fail. See Thermo-Ply, Inc. v. Ohio Willow Wood Co., No. 05-779, 2014 WL 285066, at *2 (M.D. Fla. Jan. 24, 2014) ("A judgment of invalidity in one patent action renders the patent invalid in any later actions based on the same patent."); see also DietGoal Innovations LLC v. Chipotle Mexican Grill, 70 F. Supp. 3d 808, 811, 816 (E.D. Tex. 2014) (holding that a prior decision finding patent claims to be invalid as unpatentable subject matter afforded collateral estoppel affect to suit involving the same patent).

IV. **CONCLUSION**

For the foregoing reasons, and upon review of the Patents at issue, the parties' briefs, and

the arguments raised in open Court, the Court grants the Motion to Dismiss the claims as to the

'581 Patent without prejudice for lack of subject matter jurisdiction, and also grants the Erie and

Highmark Defendants' Motion to Dismiss based on patent ineligibility as to the '434 Patent with

prejudice. Moreover, if the Court concluded that it had jurisdiction as to the '581 Patent, it

would also grant the Motions to Dismiss on patent ineligibility grounds with prejudice. Finally,

the Court grants the Old Republic Defendants' Motion to Dismiss as to the '434 Patent and the

'002 Patent with prejudice. Because the Court concludes the '002 Patent is not directed to patent

eligible subject matter, claims based on infringement of it against the Erie and Highmark

Defendants must also dismissed with prejudice.

An appropriate Order will issue.

United States District Judge

Dated: September 25, 2015

cc: All counsel of record

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A77

(12) United States Patent

Hofmann et al.

(10) Patent No.: US 6,519,581 B1

(45) **Date of Patent:** Feb. 11, 2003

(54) COLLECTION OF INFORMATION REGARDING A DEVICE OR A USER OF A DEVICE ACROSS A COMMUNICATION LINK

(75) Inventors: **William D. Hofmann**, Berkeley, CA (US); **John C. Hurley**, Sanata Clara,

CA (US)

(73) Assignee: Alset, Inc, Palo Alto, CA (US)

(*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/844,858

(22) Filed: Apr. 27, 2001

Related U.S. Application Data

(63) Continuation of application No. 09/017,112, filed on Jan. 31, 1998, now Pat. No. 6,236,983.

(51)	Int. Cl. ⁷	G06F 7/00
(52)	U.S. Cl	706/47 ; 706/45; 706/46
(58)	Field of Search	706/45 46 47

706/52, 61; 707/101, 102

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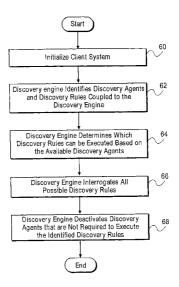
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(57) ABSTRACT

A system is provided for collecting information regarding a device or a user of a device. Information is collected from a discovery agent residing on the computer system. At certain times, the agent may be activated to collect the information. A sender transmits a discovery rule across a communication link to a computer system. The discovery agent and the discovery rule are separate code sequences or separate programs. The discovery rule is then applied to the information received from the discovery agent and the resulting information is returned back to the sender. Where the sender receives a user request, such as regarding the computer system, the discovery rule may be transmitted and the sender may use the resulting information to respond to the user request.

47 Claims, 6 Drawing Sheets



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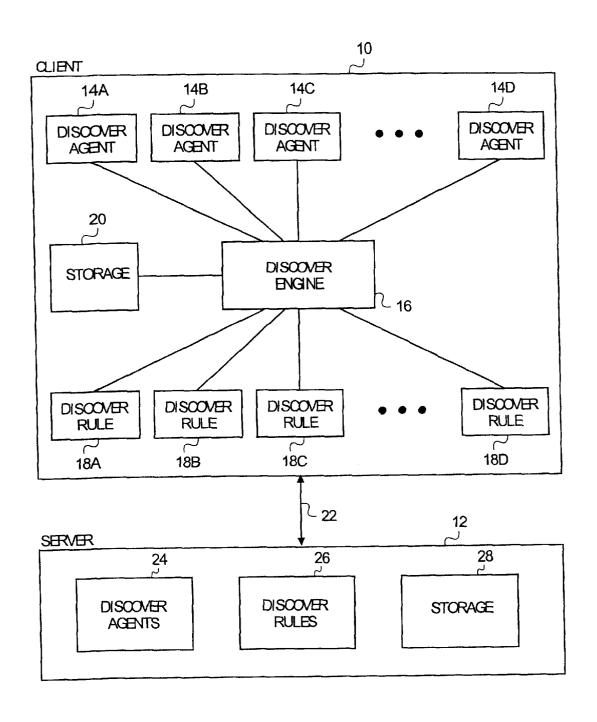


FIG. 1

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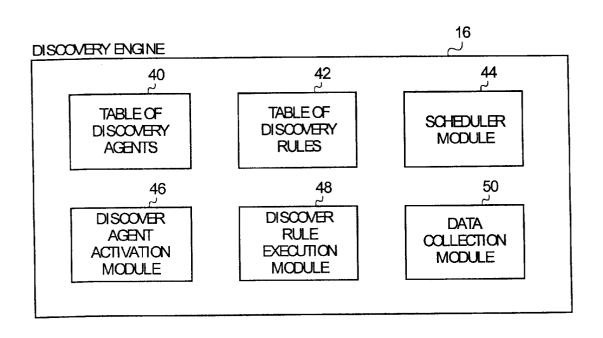


FIG. 2

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Discovery	Data Callested by Discovery Agent	Invoke Interval
Agent Name Data Collected by Discovery Agent		
HWConfiguration	ProcessorMfr, ProcessorModel, ProcessorSpeed, RAMSize, ConnectedDevices	5 min.
DiskDriveInfo	DiskCapacity, DiskRemovable, UnusedDiskSpace	1 min.
MemoryInfo	UnusedRAM, CacheUsage, LargestContiguousBlock	5 sec.
SWConfiguration	OperatingSystem, OpSysVersion, SoftwareList	5 min.
ActiveWindows	OpenWindows, FrontTitle, FrontPosition, FrontSize, FrontType	10 sec.
PersonalInfo	Hobbies, VacationPreference, Occupation, Gender	5 sec.

FIG. 3

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Discovery Rule Name	Data Required to Execute Discovery Rule
DiskDriveStatus	DiskCapacity, UnusedDiskSpace
System Status	UnusedDiskSpace, UnusedRAM, LargestContiguousBlock, OpenWindows
UpgradeWindow	OpenWindows, FrontTitle
GolfGamers	Hobbies, SoftwareList

FIG. 4

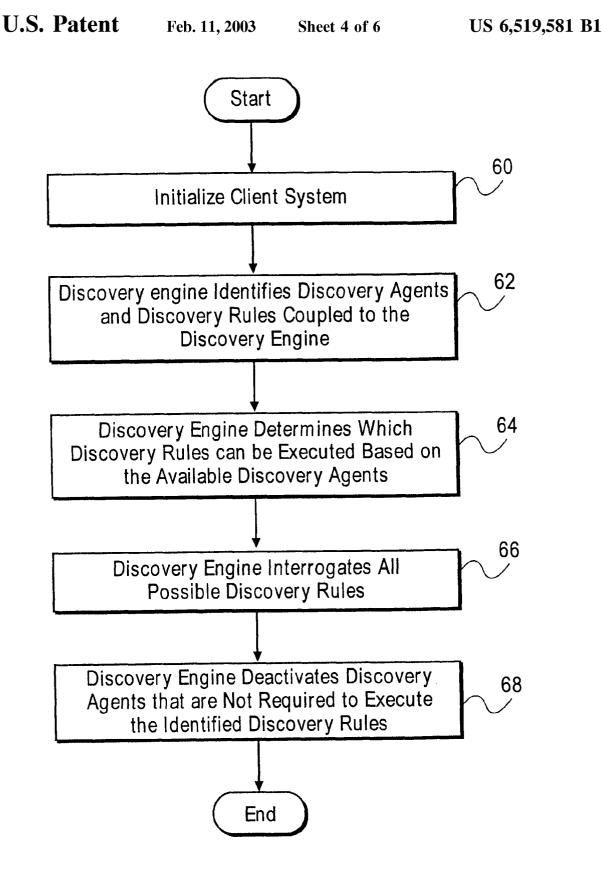
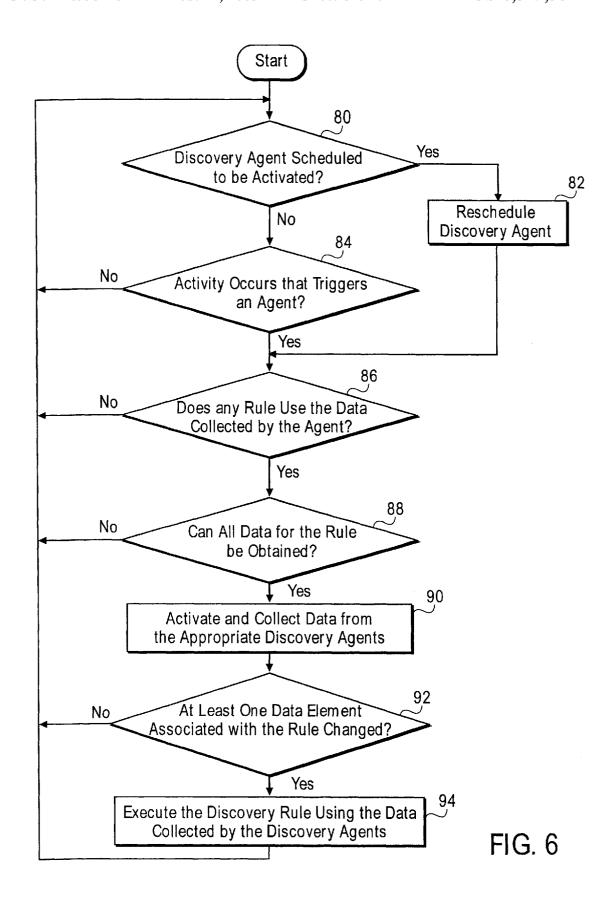


FIG. 5

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U.S. Patent Feb. 11, 2003 US 6,519,581 B1 Sheet 6 of 6 MDEO DISPLAY PRINITE 118 **₩** POINTING DEVICE 116 **PROCESSOR** INPC! <u>₩</u> DISK DRIVE INPUT/OUTPUT

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COLLECTION OF INFORMATION REGARDING A DEVICE OR A USER OF A **DEVICE ACROSS A COMMUNICATION** LINK

RELATED APPLICATION

This is continuation of application Ser. No. 09/017,112, now U.S. Pat. No. 6,236,983, filed Jan. 31, 1998.

FIELD OF THE INVENTION

The present invention relates to information collection systems. More specifically, the invention provides a system for collecting information regarding a device or a user of a device.

BACKGROUND

Different types of systems and procedures are available for collecting or retrieving information from a device or a user of a device. The collected information may be used to 20 analyze system performance, identify existing problems, or identify potential problems. If a problem or potential problem is identified, a user or administrator of the system is notified of the problem and can take an appropriate action.

Existing procedures for collecting or retrieving informa- 25 tion are typically contained in a software application or a built-in diagnostic routine that performs one or more procedures to monitor specific portions of a system. Generally, these procedures are included in a single application or a diagnostic routine that retrieves information about the system and analyzes the retrieved information. Therefore, these procedures retrieve a particular set of information and perform a particular analysis on the information.

These existing applications or diagnostic routines are not easily modified if a user or administrator wants to change the information retrieved or change the analysis performed on the retrieved information. To make such a change requires modifying the application source code or modifying the built-in diagnostic routine, both of which can be complicated and time-consuming.

Additionally, many existing applications are invoked and operated by a user of the system. Instead of running automatically or running in a "background" mode, these applications are executed at the direction of the user. Thus, to $_{45}$ retrieve data about the system using this type of application, the user must install the application and know how to operate and command the application. If the application is used infrequently (e.g., only when a problem occurs), the user is not likely to be proficient when operating the application. In this situation, the user may need to re-learn the operation of the application before retrieving and analyzing data about the system.

It is therefore desirable to provide a system that collects information automatically while requiring minimal interac- 55 nism on a client system. tion with the user of the system. Additionally, it is desirable to provide an information collection system that is easily modified to collect different types of data and perform different operations on the collected data.

SUMMARY OF THE INVENTION

Embodiments of the present invention provide a system for passively and actively collecting information about a device, such as a computing device and/or the user of the collect information about a device or its user. The discovery agents do not have intelligence to understand the collected

information. Instead, the discovery agents communicate the collected information to a discovery engine, which receives collected data from the discovery agents and applies discovery rules to the collected data. The discovery rules determine what, if any, action is to be taken based on the collected data.

In one embodiment, the discovery rule is transmitted across a communication link to a computer system and the resulting information, e.g. analysis and collected information, is received back from the computer system through the link. In some instances, the sending of the discovery rule may be due to a user request. At times, the sender of the request is a remote individual. For example, the request may be a request for assistance made to a technical support representative or sales representative. In this case, the collected information/analysis information may be used to provide a respond to the user request.

In still other embodiments, the discovery rule is transmitted automatically, when the computer system establishes a connection with a server.

In particular embodiments of the invention receives information from a discovery agent, which collects information when activated. The discover agents may be periodically activated to collect information. The invention determines a discovery rule to be applied to the information received from the discovery agent. The discovery rule is then applied to the information received from the discovery agent. The discovery agent and the discovery rule are separate code sequences.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is illustrated by way of example in the following drawings in which like references indicate similar elements. The following drawings disclose various embodiments of the present invention for purposes of illustration only and are not intended to limit the scope of the invention.

- FIG. 1 illustrates an embodiment of a client and a server capable of implementing the teachings of the present inven-
- FIG. 2 illustrates an embodiment of a discovery engine that receives data collected by one or more discovery agents and applies one or more discovery rules using the received data.
- FIG. 3 illustrates an embodiment of a table identifying various discovery agents and the data collected by each discovery agent.
- FIG. 4 illustrates an embodiment of a table identifying various discovery rules and the data required to execute each discovery rule.
- FIG. 5 is a flow diagram illustrating an embodiment of a procedure for initializing an information discovery mecha-
- FIG. 6 is a flow diagram illustrating an embodiment of a procedure for handling the activation of discovery agents and the execution of discovery rules.
- FIG. 7 illustrates an embodiment of a computer system that can be used with the present invention.

DETAILED DESCRIPTION

The following detailed description sets forth numerous device. The system uses one or more discovery agents to 65 specific details to provide a thorough understanding of the invention. However, those of ordinary skill in the art will appreciate that the invention may be practiced without these

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specific details. In other instances, well-known methods, procedures, protocols, components, algorithms, and circuits have not been described in detail so as not to obscure the invention.

The present invention provides a system for passively and actively collecting information about a device, such as a computing device and/or the user of the device. The system uses one or more discovery agents (implemented using individual programs or code sequences) to collect information about a device or its user. The discovery agents themselves have no intelligence regarding how to interpret or act on the collected data. Instead, the discovery agents merely communicate the collected data to a discovery engine, which is a central control module for the information collection system. The discovery engine receives collected data from the discovery agents and applies one or more discovery rules to the collected data. The discovery rules determine what, if any, action is to be taken based on the collected data. As discussed below, the discovery rules may be a series of parisons or evaluations of the collected data.

The discovery agents are separate programs (or code sequences) from the discovery rules, and there is no particular relationship between the discovery agents and the discovery rules. A particular discovery agent may collect data that is used by one or more discovery rules. Similarly, a particular discovery rule may use data collected by one or more discovery agents. Thus, if a particular piece of data collected by a discovery agent is used by multiple discovery rules, that data need only be collected once, rather than retrieving the required data multiple times (once for each discovery rule requiring the information). The discovery engine is responsible for determining what data is required by a particular discovery rule and activating the appropriate discovery agents to collect the required data.

Since the discovery agents and the discovery rules are not linked to one another, new discovery agents can be generated and existing discovery agents can be modified without necessarily requiring a corresponding change to the existing discovery rules. Similarly, an existing discovery rule can be changed or an additional rule added without necessarily making any changes to the existing discovery agents. For example, a new discovery rule may be created that uses data from existing discovery agents. In this situation, no additional discovery agents are required to implement the new discovery rule. Thus, the operation of the information collection system can be modified without requiring a revision of all agents and rules contained in the system.

The updating of discovery agents and discovery rules can 50 be accomplished by downloading agents or rules from a server or other device, or installed from a diskette or other storage medium. In one embodiment of the invention, new or revised agents and rules are downloaded automatically from a server to the device when the device establishes a 55 connection with the server. This embodiment updates the agents and rules without requiring any user interaction or user control. Since the discovery agents and discovery rules are separate programs or code sequences, individual agents and rules can be communicated across a common data communication link, without requiring a high-speed or high-bandwidth communication link.

Particular embodiments of the invention allow an individual, such as a technical support representative or a sales representative, to download a particular discovery 65 agent or discovery rule to a client across a communication link, without requiring action by the user of the client. In a

particular example, the user of a client requests assistance from a technical support representative. The technical support representative can then download discovery agents and discovery rules that collect and analyze information about the client system. This collected information and analysis is communicated back to the technical support representative for use in providing assistance to the user of the client.

FIG. 1 illustrates an embodiment of a client 10 and a server 12 capable of implementing the teachings of the present invention. Client 10 includes multiple discovery agents 14a, 14a, 14c, and 14d. Although FIG. 1 illustrates four discovery agents, a particular client may include any number of discovery agents. Each discovery agent 14a-4d is coupled to a discovery engine 16 and is capable of communicating information from the discovery agent to the discovery engine. Discovery agents 14a-14d collect information about the client or the user of client 10. The information collected may include the hardware and software configuration of client 10 and the hobbies or personal interests of the Boolean operations, mathematical equations, or other com20 user of client 10. As discussed in greater detail below, discovery engine 16 is responsible for activating particular discovery agents, thereby causing the activated agents to collect data about client 10 or the user of client 10. The information collected by discovery agents 14a-4d is communicated to discovery engine 16. A particular set of discovery agents may be installed on client 10 by the manufacturer as part of the manufacturing process. Additional discovery agents can be downloaded or otherwise installed on the client in the future to perform additional data collection operations. Similarly, additional discovery rules can be installed on the client in the future to perform additional analysis.

> Client 10 also contains multiple discovery rules 18a, 18b, **18***c*, and **18***d*. Although four discovery rules are illustrated in FIG. 1, a particular client 10 may include any number of discovery rules. Additionally, the number of discovery rules need not correspond to the number of discovery agents. As discussed above, the discovery rules and the discovery agents are independent of one another. Discovery engine 16 receives data collected from one or more discovery agents **14***a***–14***d* and uses the received data to execute one or more discovery rules 18a–18d. A particular discovery rule may require one or more data elements retrieved from one or more discovery agents 14a-14d. As discussed below, a 45 discovery rule may compare the collected data to a predetermined value or threshold value, or may compare one collected data value to another collected value. A particular discovery rule may contain Boolean expressions, mathematical equations or other data operation or data comparison. The result of a particular discovery rule may store the received data, invoke another discovery rule, or combine the received data with previously stored data (e.g., performing data averaging). An exemplary discovery rule is provided below:

StorageMediaConfig.StorageMediaList[i] .AvailableSpace<50 MB AND

NOT StorageMediaConfig.StorageMediaList[i] .IsRemovable

THEN

increment profile.system.devices.fixedmedia.lowerWaterMarkCount

Additionally, the result of a particular discovery rule may trigger one or more activities or events. For example, a particular discovery rule may generate a warning to the user of client 10 if the available disk space or available memory falls below a particular threshold. In this situation, the

discovery rule will receive collected data regarding the available disk space and the available memory in client 10. That data is initially collected by discovery engine 16 from one or more discovery agents 14a-14d. The discovery rule then compares the collected data to its predetermined thresholds. If the available disk space or the available memory falls below the predetermined threshold, then a warning is generated and displayed or otherwise provided to the user of client 10. If the available disk space and the available memory are above the predetermined threshold, then the rule 10 identifier) of each discovery rule contained in the client, and may complete execution without causing the occurrence of any particular activity or operation.

Client 10 also includes a storage mechanism 20 coupled to discovery engine 16. Storage mechanism 20 can be used to store various tables and other configuration information 15 used by discovery engine 16 during its regular operation. Additionally, storage mechanism 20 may store data generated during execution of one or more discovery rules.

Client 10 is coupled to server 12 using a communication link 22. Communication link 22 can be any type of com- 20 munication link using any type of communication medium. In a particular embodiment of the invention, client 10 and server 12 are coupled to one another across a network, such a local area network (LAN), a wide area network (WAN), or the Internet. Server 12 includes one or more discovery agents 24, one or more discovery rules 26, and a storage mechanism 28. Although server 12 contains discovery agents 24 and discovery rules 26, the server does not necessarily activate the discovery agents or execute the discovery rules. Instead, the server stores various discovery 30 agents 24 and discovery rules 26 for transmission to one or more clients, which are then activated or executed by the discovery engine contained in the client.

Storage device 28 in server 12 can be used to store various the various discovery rules and discovery agents already installed on each client. In a particular embodiment of the invention, storage device 28 also maintains the particular version of each discovery agent and discovery rule installed on each client. A typical server 12 is coupled to multiple 40 clients 10. Although multiple clients 10 may be coupled to server 12, only particular clients may contain discovery agents, discovery rules and a discovery engine for coordinating the collection of data. Any number of clients 10 coupled to server 12 may be capable of implementing the 45 example, the data collected by a particular discovery agent information collection system of the present invention. A particular client 10 may be coupled to multiple servers 12 and may receive discovery agents and discovery rules from multiple servers.

FIG. 1 illustrates a particular embodiment of a client 50 capable of implementing an information collection system as described herein. Similarly, server 12 is one embodiment of a server capable of distributing discovery agents and discovery rules to one or more clients. Particular components of client 10 and server 12 are not shown in FIG. 1, for 55 purposes of simplifying the illustration. For example, processors, memory devices, printing devices, and other components and devices commonly used in computer devices are not shown in FIG. 1. However, those of ordinary skill in the art will appreciate that these additional components can be added to client 10 or server 12 without affecting the operation of the invention.

FIG. 2 illustrates an embodiment of a discovery engine 16 that receives data collected by one or more discovery agents and applies the collected data to one or more discovery rules. 65 Discovery engine 16 includes a table of discovery agents 40, which contains information about the various discovery

agents contained in the client. Table 40 includes, for example, the name (or other unique identifier) of the discovery agent, the data collected by the discovery agent when the agent is activated, and the typical time interval between activations of the discovery agent. An exemplary table of discovery agents 40 is illustrated in FIG. 3, and discussed below.

Discovery engine 16 also includes a table of discovery rules 42. Table 42 contains the name (or other unique information regarding the data required to execute each discovery rule. As discussed above, a particular discovery rule may require one or more data elements, which are collected by one or more discovery agents. An exemplary table of discovery rules 42 is illustrated in FIG. 4, and discussed below.

Discovery engine 16 also includes a scheduler module 44. Particular discovery agents may require activation and periodic time intervals (e.g., activated once every two seconds or once every minute). Scheduler module 44 maintains the information regarding the periodic activation of the discovery agents contained in the client. The scheduler module may maintain its own table or register of information regarding the next activation of each discovery agent, or that information may be stored in the table of discovery agents **40**. When a particular discovery agent is scheduled to be activated, scheduler module 44 causes a discovery agent activation module 46 to perform the steps necessary to activate the discovery agent. Additionally, discovery agent activation module 46 may receive requests to activate a particular discovery agent from an external source (such as an activity or an event) other than the expiration of a time interval. These external activities or events may be received from another device coupled to a common network. information regarding the clients coupled to the server and 35 Additionally, the external activities or events can be generated by the local system (i.e., the device implementing the information collection system). Module 46 is able to determine whether or not a particular discovery agent should be activated when an activation signal is received from scheduler module 44 or another event.

> In certain situations, the scheduler module 44 or other event may indicate that a discovery agent should be activated. However, discovery agent activation module 46 may override the activation request based on other factors. For may not be required by any currently active discovery rule. In this situation, although a discovery agent may be scheduled to be activated, any data collected by the discovery agent would not be used. Therefore, the activation of the discovery agent is unnecessary, and module 46 prevents the activation of the discovery agent.

> Discovery engine 16 also includes a discovery rule execution module 48, which is used to apply the various discovery rules contained in the client to the data collected by the discovery agents (and received by discovery engine 16). Based on the results of the discovery rule execution, module 48 may activate one or more activities or operations (e.g., displaying a message to the user of the client). Additionally, the results of the discovery rule execution may activate other agents or rules.

> Discovery engine 16 also includes a data collection module 50, which receives the data collected by the various discovery agents coupled to discovery engine 16. Data collection module 50 may be a register or other storage device capable of storing the collected data until the discovery rule has been executed. At that time, the data used by the discovery rule is discarded; unless needed by another

7 discovery rule being executed or a discovery rule causes the data to be saved. Generally, after all discovery rules requir-

ing a particular data element have been executed, the data element is discarded. Thus, the collected data from the discovery agents is discarded after the rules have been executed, thereby reducing the storage requirements of the

information discovery system.

FIG. 3 illustrates an embodiment of a table of discovery agents 40 that identifies discovery agents and the data collected by each discovery agent. The table illustrated in 10 FIG. 3 contains information regarding six discovery agents. A particular table of discovery agents may contain any number of entries, based on the number of discovery agents contained in the client. For example, a particular information discovery agents, and a corresponding number of entries in the table of discovery agents.

Referring to the example of FIG. 3, a hardware configuration discovery agent (HWConfiguration) collects data regarding the processor manufacturer, the processor model, 20 the processor speed, the installed memory, and information regarding the various devices contained in or connected to the client. Table 40 also contains information regarding the interval between activations of each discovery agent. In this example, the hardware configuration discovery agent is activated every five minutes. Since the hardware configuration is not likely to change on a frequent basis, the interval between activations of the discovery agent can be relatively large. However, the memory status of the client may change regularly, such that the memory information discovery agent 30 (MemoryInfo) is activated every five seconds.

In an alternate embodiment of table 40, the hardware configuration discovery agent (HWConfiguration) does not collect information regarding the various devices contained hardware configuration discovery agent may have an activation interval of "once at startup." Since the processor manufacturer, processor model, and processor speed do not generally change while the device is operating, the agent only needs to be activated when the device is powered-up.

The time between discovery agent activations may be contained within the discovery agent itself and communicated to the discovery engine when the discovery agent is initialized or first activated. Thus, the developer of the cessive activations of the discovery agent. However, the user or administrator of the client may change the time interval based on their own knowledge of the system or their own requirements or priorities. Therefore, the interval identified in table 40 may not correspond to the interval provided in the 50 discovery agent by the developer of the discovery agent.

The hardware configuration agent and the memory information agent are examples of agents that collect information passively; i.e., without requiring the interaction of the user of the client. These passive agents monitor system activity 55 and system configuration automatically, and collect information without requiring user interaction. Table 40 also contains a personal information agent (PersonalInfo) that contains information regarding the user's hobbies, occupation, and other personal information. This personal information agent is an example of an active discovery agent that collects information actively; i.e., by specifically asking questions of the user through a dialog box or similar mechanism. This type of active discovery agent requires interaction by the user to provide the requested information. 65 executed using the available discovery agents.

In alternative embodiments of table 40 shown in FIG. 3, each discovery agent contains information regarding 8

whether the discovery agent is currently active (i.e., whether one or more discovery rules require information collected by that discovery agent). Additionally, table 40 may contain information regarding the next scheduled activation of each discovery agent. In other embodiments of the invention, the active status of each discovery agent and the next scheduled activation time for each discovery agent is stored in a separate table, register, or other storage mechanism accessible by the discovery engine.

FIG. 4 illustrates an embodiment of a table of discovery rules 42 identifying various discovery rules and the data required to execute those discovery rules. For example, a discovery rule entitled "DiskDriveStatus" requires data related to the disk capacity and the unused disk space to discovery system may contain hundreds or thousands of 15 execute the discovery rule. Thus, based on the discovery agents listed in FIG. 3, the DiskDriveStatus discovery rule can be executed using data collected by the disk drive information discovery agent. Other discovery rules may require data collected by multiple discovery agents. For example, the discovery rule "SystemStatus" shown in table 42 requires information from the disk drive information discovery agent, the memory information discovery agent, and the active windows discovery agent. Thus, all three agents must be activated to collect the information necessary to execute the SystemStatus discovery rule. The discovery engine uses the information contained in table 42 to determine which discovery agents need to be activated to collect the data required to execute a particular discovery rule.

FIG. 5 is a flow diagram illustrating an embodiment of a procedure for initializing an information collection system on a client system. At step 60, the client system is initialized. At step 62, the discovery engine identifies discovery agents and discovery rules that are coupled the discovery engine. The discovery agents publish a unique identifier as part of in or connected to the client. In this embodiment, the 35 the interface between the discovery agent and the discovery engine. The data collected and provided to the discovery engine is tagged with a unique data identifier. The discovery rules use this same tag to identify the information required to execute the rule.

At step 64, the discovery engine determines which discovery rules can be executed based on the available discovery agents. This determination is performed by identifying the data required to execute a particular discovery rule and determining whether one or more discovery agents are discovery agent may define the time interval between suc- 45 available that can retrieve the required data for the execution of the discovery rule. If a particular discovery rule requires a data element that cannot be retrieved by the available discovery agents, then the discovery rule will be flagged as "inactive" until one or more additional discovery agents are provided to collect the data required to execute the discovery rule. At step 66, the discovery engine interrogates all possible discovery rules to determine the discovery agents required by the discovery rules.

At step 68 of FIG. 5, the discovery engine deactivates the discovery agents that are not required to execute the identified discovery rules. Thus, if information collected by a particular discovery agent is not used by any of the active discovery rules, then the discovery engine does not activate the discovery agent, thereby minimizing the unnecessary use of system resources. The procedure discussed above with respect to FIG. 5 may be performed each time a new discovery agent or discovery rule is added to a device. Thus, the system maintains a current list of available discovery agents and a current list of discovery rules that can be

FIG. 6 is a flow diagram illustrating an embodiment of a procedure for handling the activation of discovery agents

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and the execution of discovery rules. At step 80, the procedure determines whether a discovery agent is scheduled to be activated. If the agent is scheduled to be activated, then the procedure branches to step 82, where the discovery agent is rescheduled for its next activation, based on the interval between activations. If the discovery agent is not scheduled to be activated, then the procedure continues from step 80 to step 84 to determine whether another activity or event occurred that triggered the activation of a particular discovery agent. If not, the procedure returns to step 80 to repeatedly check for a scheduled activation (step 80) or an activation from another event (step 84).

If step 84 identifies an event or activity that triggers the activation of a discovery agent, the procedure continues to step 86 to determine whether any discovery rule uses the data collected by the discovery agent. If not, the procedure returns to step 80, thereby avoiding the unnecessary activation of a discovery agent. Additionally, a particular discovery agent may be deactivated if the data collected by the agent is not used by any discovery rule. If the data collected by the agent is used by at least one discovery rule, then the 20 procedure continues to step 88 to determine whether all data for the discovery rule can be obtained from the available discovery agents. If not, the procedure returns to step 80 without activating the discovery agents or executing the discovery rule. Additionally, if all data for a particular rule cannot be collected the discovery rule may be flagged "inactive."

At step 90, the procedure activates and collects data from the appropriate discovery agents. The appropriate discovery agents are those agents that are scheduled to be activated, 30 shown). agents activated based on another event, or agents necessary to collect data to execute a particular discovery rule. At step 92, the procedure determines whether at least one data element associated with the discovery rule has changed elements have changed since the last time the discovery rule was executed, the rule is not executed again because the result of the rule would not change. If at least one data element has changed, then the procedure continues to step 94, where the discovery rule is executed using the data 40 collected by the discovery agents. The procedure then returns step 80.

In an alternate embodiment of the invention, step 92 of FIG. 6 is not performed by the information collection discovery agents and used by the discovery rules without determining whether a change in the data occurred since the last execution of the discovery agent. In this embodiment, the discovery engine need not analyze or otherwise compare data collected by the discovery agents. Instead, the discov- 50 ery engine merely receives data collected by the discovery agents and provides the data to the discovery rules.

Although not shown in FIG. 6, the discovery agents and discovery rules may be updated periodically by one or more servers or other software distribution mechanisms. This 55 updating allows the discovery agents and the discovery rules to be updated independently of one another. As discussed above, the discovery agents are not associated with a particular discovery rule, and the updating of an agent does not directly affect the content of any of the discovery rules. Similarly, the updating of one or more discovery rules does not directly affect the content of any of the discovery agents. The various steps illustrated in FIG. 6 and described above may be performed by a discovery engine of the type discussed above with respect to FIGS. 1 and 2.

The procedure discussed above with respect to FIG. 6 refers to a discovery rule. However, embodiments of the 10

invention may perform the procedure illustrated in FIG. 6 on several discovery rules simultaneously. For example, step 88 may determine whether all data for several discovery rules can be obtained from the available agents. If all data cannot be obtained, then the system executes only those rules for which the required data can be collected.

FIG. 7 illustrates an embodiment of a computer system that can be used with the present invention. For example, embodiments of the invention may use a computer of the type shown in FIG. 7 as a client and/or a server. The various components in FIG. 7 are provided by way of example. Certain components of the computer in FIG. 7 can be deleted for particular implementations of the invention. The computer system shown in FIG. 7 may be any type of computer, including a general purpose computer.

FIG. 7 illustrates a system bus 100 to which various components and devices are coupled. A processor 102 performs the processing tasks required by the computer. Processor 102 may be any type of processing device capable of implementing the steps necessary to perform the various procedures and operations discussed above. An Input/Output (I/O) device 104 is coupled to bus 100 and provides a mechanism for communicating with other devices coupled to the computer. A Read-Only Memory (ROM) 106 and a Random Access Memory (RAM) 108 are coupled to bus 100 and provide a storage mechanism for various data and information used by the computer. Although ROM 106 and RAM 108 are shown coupled to bus 100, in alternate embodiments, ROM 106 and RAM 108 are coupled directly to processor 102 or coupled to a dedicated memory bus (not

A video display 110 is coupled to bus 100 and displays various information and data to the user of the computer. A disk drive 112 is coupled to bus 100 and provides a mechanism for the long-term mass storage of information. An input since the last time the discovery rule was executed. If no data 35 device 114 and a pointing device 116 are also coupled to bus **100** and allow the user of the computer to enter information and commands to the computer system. Input device 114 may be, for example, a keyboard, keypad, handwriting recognition device, or voice recognition device. Pointing device 116 includes, for example, a mouse, track ball, or touch pad. A printer 118 is coupled to bus 100 and is capable of creating a hard copy of information generated by or used by the computer.

Embodiments of the present invention may be implesystem. In this embodiment, the data is received from the 45 mented using a computer-readable medium (also referred to as a processor-readable medium) containing various sets of instructions, code sequences, configuration information, and other data used by a computer or other processing device. The various information stored on the computer-readable medium is used to perform various data communication, data processing, data collection, and data handling operations, such as those described above. The computerreadable medium may be any type of magnetic, optical, or electrical storage medium including a diskette, magnetic tape, CD-ROM, memory device, or other storage medium.

From the above description and drawings, it will be understood by those of ordinary skill in the art that the particular embodiments shown and described are for purposes of illustration only and are not intended to limit the scope of the invention. Those of ordinary skill in the art will recognize that the invention may be embodied in other specific forms without departing from its spirit or essential characteristics. References to details of particular embodiments are not intended to limit the scope of the claims.

What is claimed is:

1. A method of collecting information, the method comprising:

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transmitting a discovery rule across a communication link to a computer system, wherein the discovery rule is to be applied to data about the computer system or a user to generate information, and wherein the data is collected by a discovery agent located in the computer 5 system, and

receiving the information from the computer system.

- 2. The method of claim 1, further including receiving a user request prior to transmitting the discovery rule and wherein the transmitting the discovery rule is without requir- $_{10}$ ing action by the user.
- 3. The method of claim 2, wherein the user request is for assistance regarding the computer system.
- 4. The method of claim 2, wherein the transmitting of the discovery rule is from a remote individual receiving the user
- 5. The method of claim 2, further including providing assistance to the user regarding the computer system after receiving the information.
- 6. The method of claim 1, wherein the discovery rule is $_{20}$ transmitted automatically when the computer system establishes a connection with a server.
- 7. The method of claim 1, further including transmitting the discovery agent across the communication link to the computer system and the discovery agent and discovery rule $_{25}$ are separate code sequences.
- 8. The method of claim 1, wherein the discovery agent is activated to collect the data when the discovery rule requires
- 9. The method of claim 1, wherein the discovery agent is $_{30}$ activated to collect the data according to a schedule.
- 10. The method of claim 1, wherein the discovery agent passively collects the data.
- 11. In a computer system, method of collecting information comprising:

receiving a discovery rule across a communication link from a sender,

applying the discovery rule to data about the computer system or a user to generate information, and wherein the data is collected by a discovery agent located in the 40 computer system when the discovery agent is activated and without requiring action by the user; and

communicating the information across the communication link back to the sender of the discovery rule.

- user request regarding the computer system and the receiving of the discovery rule is in response to the request.
- 13. The method of claim 12, wherein the user request is for assistance regarding the computer system.
- 14. The method of claim 12, wherein the user request is 50 made to a remote individual sender of the discovery rule.
- 15. The method of claim 13, further including receiving assistance regarding the computer system after communicating the information.
- 16. The method of claim 11, further including receiving 55 individual receiving the user request. the discovery agent across the communication link and the discovery agent and discovery rule are separate code
- 17. The method of claim 11, wherein the discovery agent is activated to collect the data when the discovery rule 60 computer system after receiving the information. requires the data.
- 18. The method of claim 11, wherein the discovery agent is activated to collect the data according to a schedule.
- 19. The method of claim 11, wherein the discovery agent passively collects the data.
- 20. A method of collecting information, the method comprising:

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receiving a user request regarding the computer system; transmitting a discovery rule across a communication link to a computer system, wherein the discovery rule is to be applied to data about the computer system or a user to generate information, and wherein the data is collected by a discovery agent located in the computer system when the discovery agent is actuated and without requiring action by the user;

receiving the information from the computer system; and providing the user with a response to the user request.

- 21. The method of claim 20, wherein the user request is for assistance regarding the computer system.
- 22. The method of claim 21, further including providing assistance to the user regarding the computer system after receiving the information.
- 23. The method of claim 20, wherein the transmitting of the discovery rule is from a remote individual receiving the user request.
- 24. The method of claim 20, wherein the discovery rule is transmitted automatically when the computer system establishes a connection with a server.
- 25. The method of claim 20, further including transmitting the discovery agent across the communication link to the computer system and the discovery agent and discovery rule are separate code sequences.
- 26. The method of claim 20, wherein the discovery agent is activated to collect the data when the discovery rule requires the data.
- 27. The method of claim 20, wherein the discovery agent is activated to collect the data according to a schedule.
- 28. The method of claim 20, wherein the discovery agent passively collects the data.
- **29**. A computer readable medium having stored therein a plurality of sequences of executable instructions, which, when executed by a processor, cause the system to:

transmit a discovery rule across a communication link to a computer system, wherein the discovery rule is to be applied to data about the computer system or a user to generate information, and wherein the data is collected by a discovery agent located in the computer system,

receive the information from the computer system.

- **30**. The computer readable medium of claim **29**, further 12. The method of claim 11, further including making a 45 including additional sequences of executable instructions, which when executed by the processor further cause the system to receive a user request prior to transmitting the discovery rule and wherein the transmitting the discovery rule is without requiring action by the user.
 - 31. The computer readable medium of claim 30, wherein the user request is for assistance regarding the computer
 - 32. The computer readable medium of claim 29, wherein the transmitting of the discovery rule is from a remote
 - 33. The computer readable medium of claim 29, further including additional sequences of executable instructions, which when executed by the processor further cause the system to provide assistance to the user regarding the
 - 34. The computer readable medium of claim 29, wherein the discovery rule is transmitted automatically when the computer system establishes a connection with a server.
 - 35. The computer readable medium of claim 29, further 65 including additional sequences of executable instructions, which when executed by the processor further cause the system to transmit the discovery agent across the commu-

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nication link to the computer system and the discovery agent and discovery rule are separate code sequences.

- **36.** The computer readable medium of claim **29**, wherein the discovery agent is activated to collect the data when the discovery rule requires the data.
- 37. The computer readable medium of claim 29, wherein the discovery agent is activated to collect the data according to a schedule.
- 38. The computer readable medium of claim 29, wherein the discovery agent passively collects the data.
- **39.** A computer readable medium having stored therein a plurality of sequences of executable instructions, which when executed by a processor, cause the system to:

receive a discovery rule across a communication link from a sender, apply the discovery rule to data about the computer system or a user to generate information, and wherein the data is collected by a discovery agent located in the computer system when the discovery agent is activated and without requiring action by the user; and

communicate the information across the communication link back to the sender of the discovery rule.

40. The computer readable medium of claim 39, further including making a user request regarding the computer

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system and the receiving of the discovery rule is in response to the user request.

- **41**. The computer readable medium of claim **40**, wherein the user request is for assistance regarding the computer system.
- 42. The computer readable medium of claim 40, wherein the user request is made to a remote individual sender of the discovery rule.
- **43**. The computer readable medium of claim **41**, further including receiving assistance regarding the computer system after communicating the information.
- 44. The computer readable medium of claim 39, further including receiving the discovery agent across the communication link and the discovery agent and discovery rule are separate code sequences.
- **45**. The computer readable medium of claim **39**, wherein the discovery agent is activated to collect the data when the discovery rule requires the data.
- **46**. The computer readable medium of claim **39**, wherein the discovery agent is activated to collect the data according to a schedule.
- 47. The computer readable medium of claim 39, wherein the discovery agent passively collects the data.

* * * * *

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(12) United States Patent Kim

(10) Patent No.: US 6,546,002 B1

(45) **Date of Patent:** Apr. 8, 2003

(54) SYSTEM AND METHOD FOR IMPLEMENTING AN INTELLIGENT AND MOBILE MENU-INTERFACE AGENT

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

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(22) Filed: Jul. 7, 1999

(51)	Int. Cl. ⁷	Но-	4L 12/28
(52)	U.S. Cl.		370/351

445, 414, 423, 401–403

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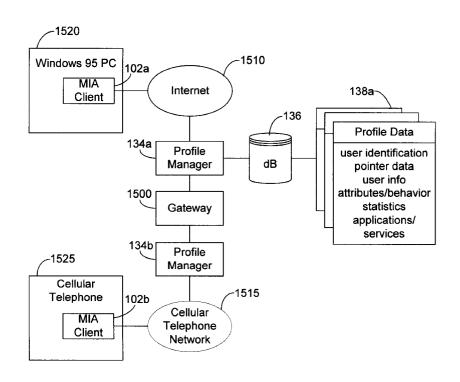
Primary Examiner—Kwang B. Yao
Assistant Examiner—Prenell Jones
(74) Attorney Accept on Firm Billshops Winth

(74) Attorney, Agent, or Firm-Pillsbury Winthrop LLP

(57) ABSTRACT

The present invention provides a system and method for using a mobile interface agent to dynamically access programs, applications, bookmarked URLs, IP addresses, telephone numbers, television channels, radio stations, user profiles, and the like that are specific to a user via any computer type device. The mobile interface agent can be accessible using any computer from any geographical location so long as the computer can be connected to a network. The mobile interface agent is basically an agent that allows the user to access documents, files, programs, applications, URL bookmarks, IP addresses, telephone numbers, television channels, radio stations, and other menu items from any computer. Moreover, the present invention relates to a per user based licensing model that allows the user to remotely access and use computer programs.

49 Claims, 15 Drawing Sheets



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FIG. 1A

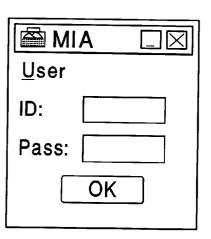


FIG. 1B



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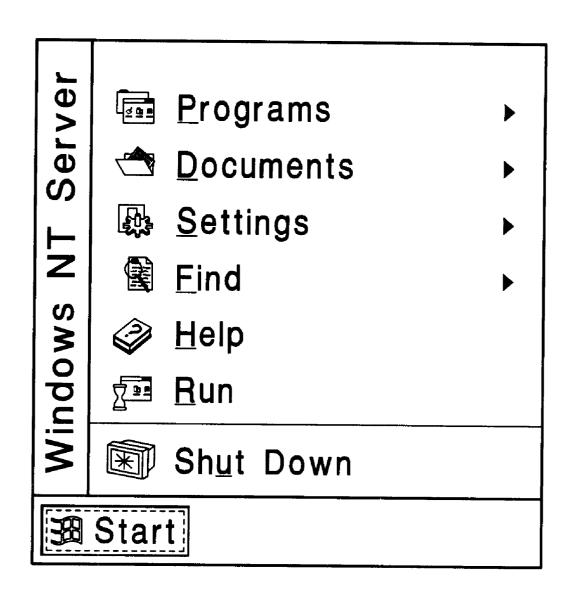
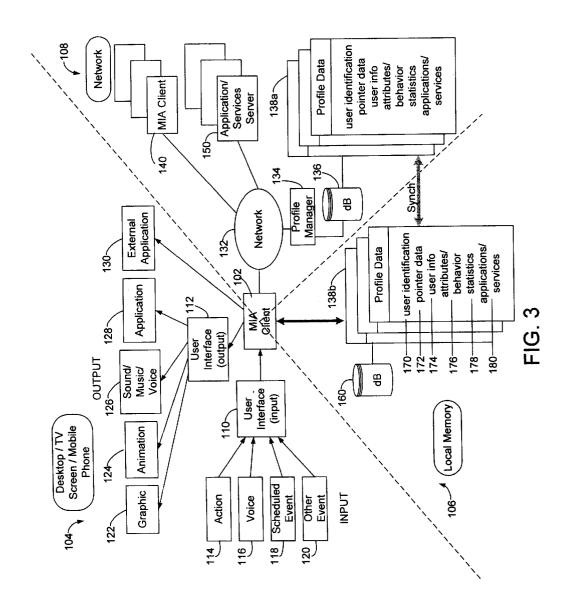


FIG. 2

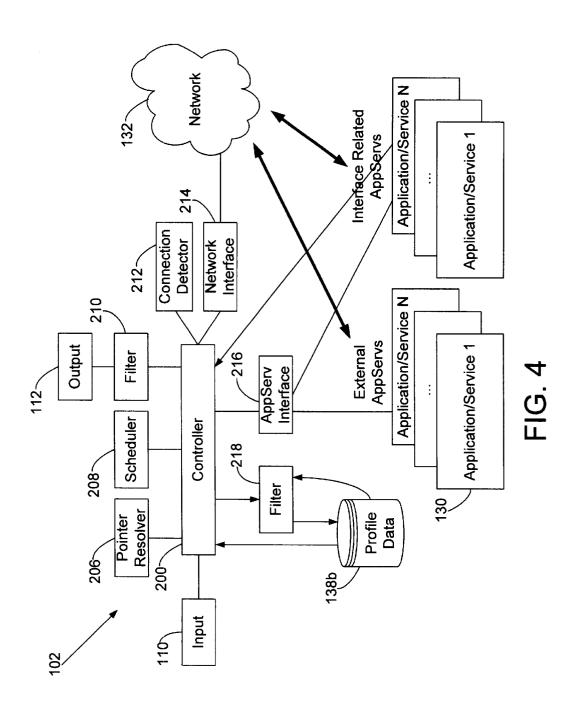
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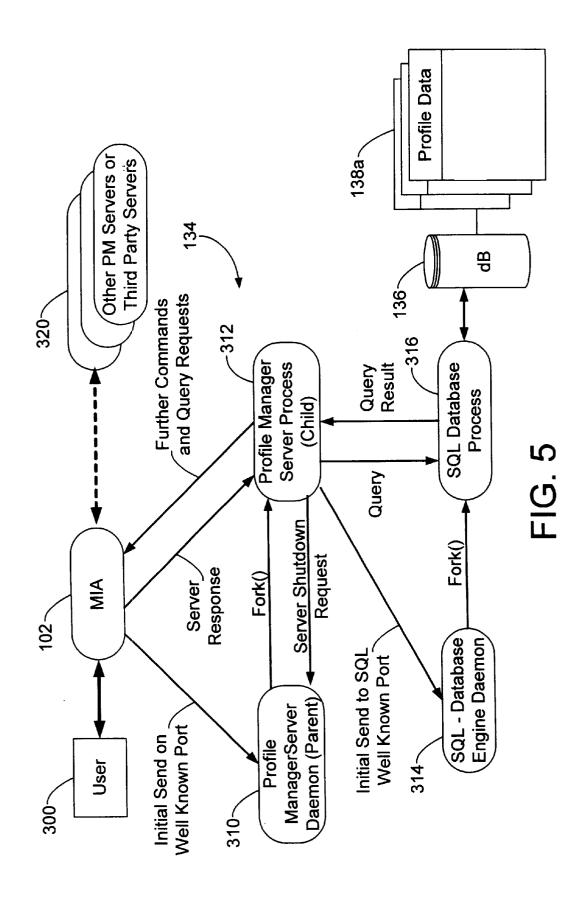
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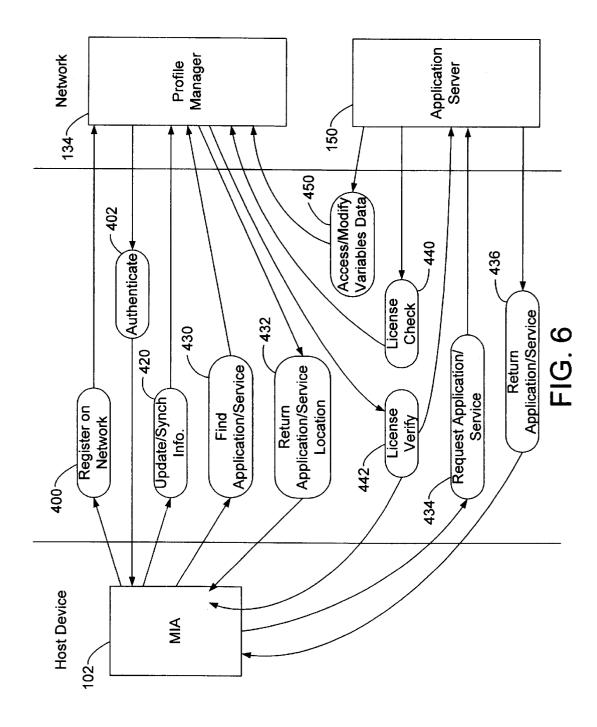
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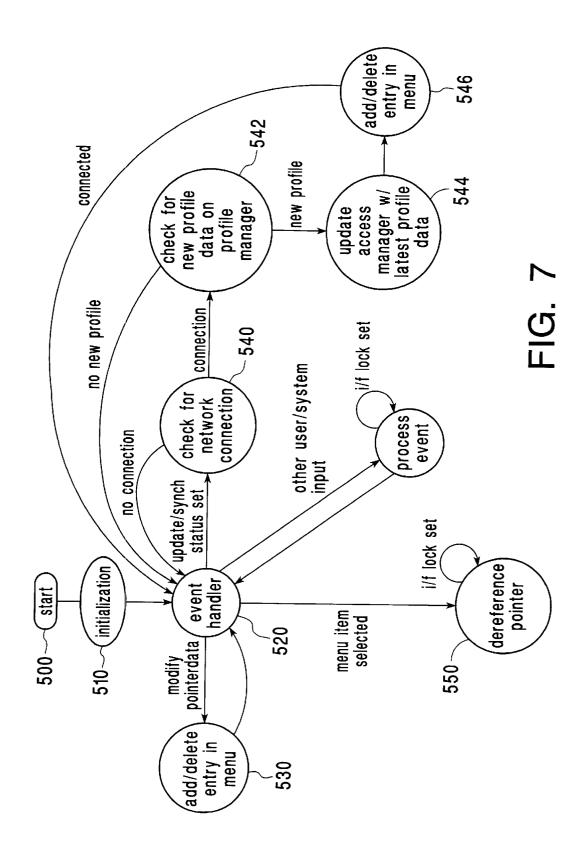
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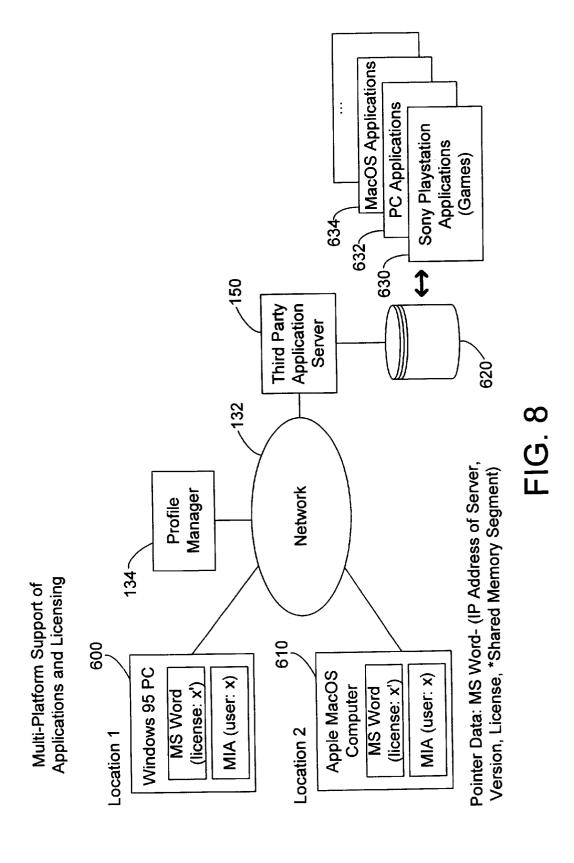
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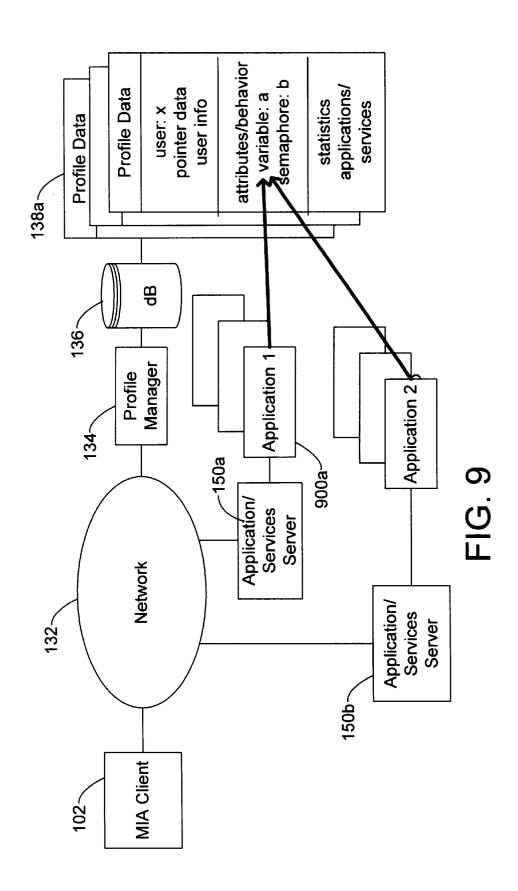
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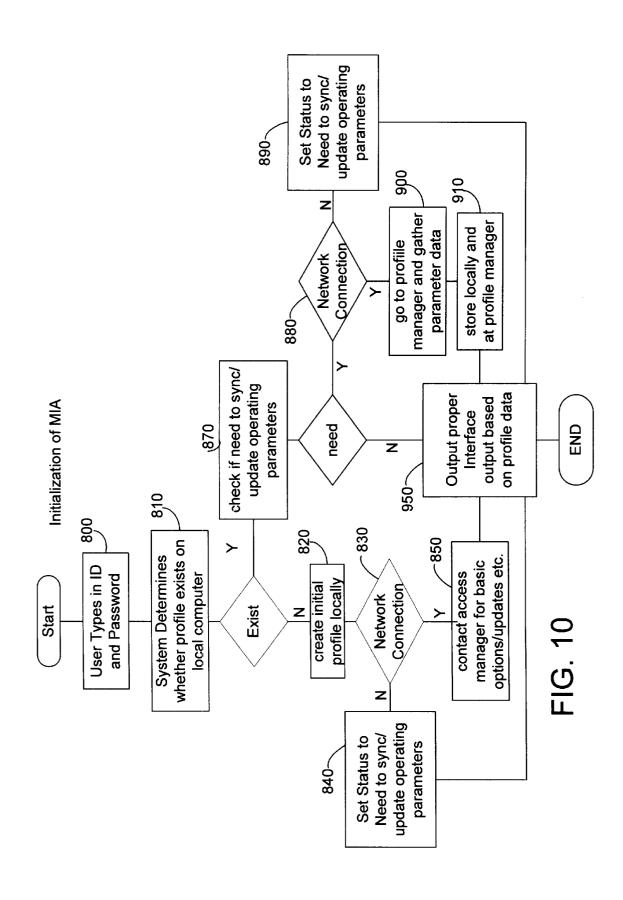
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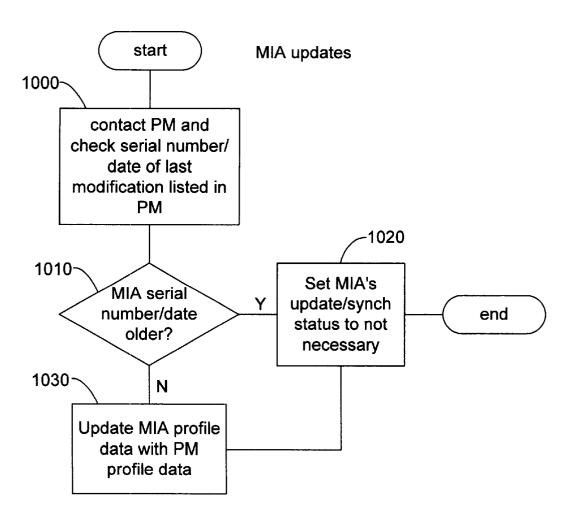
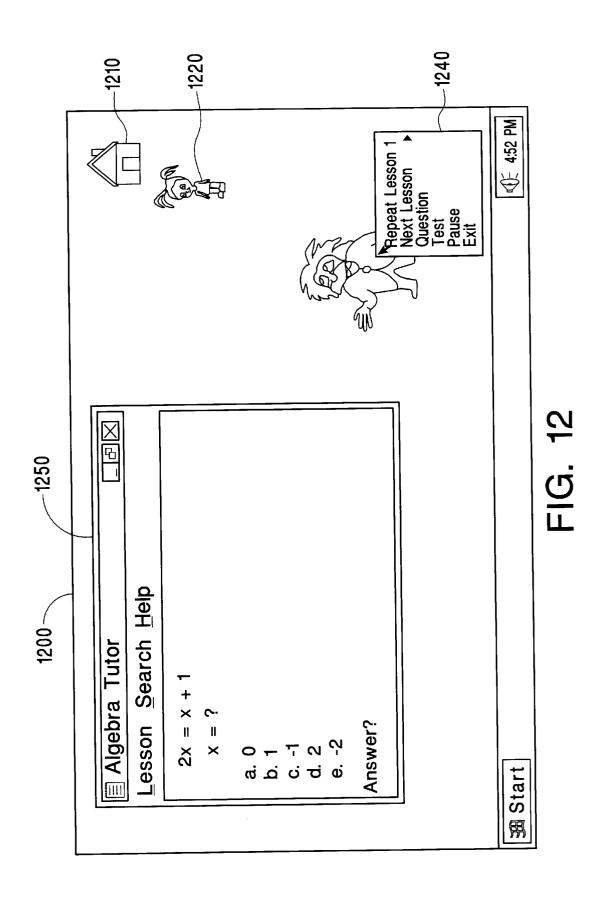


FIG. 11

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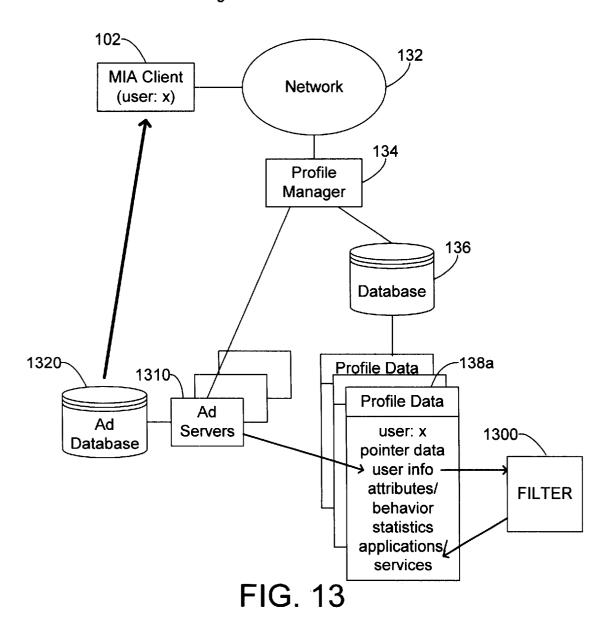


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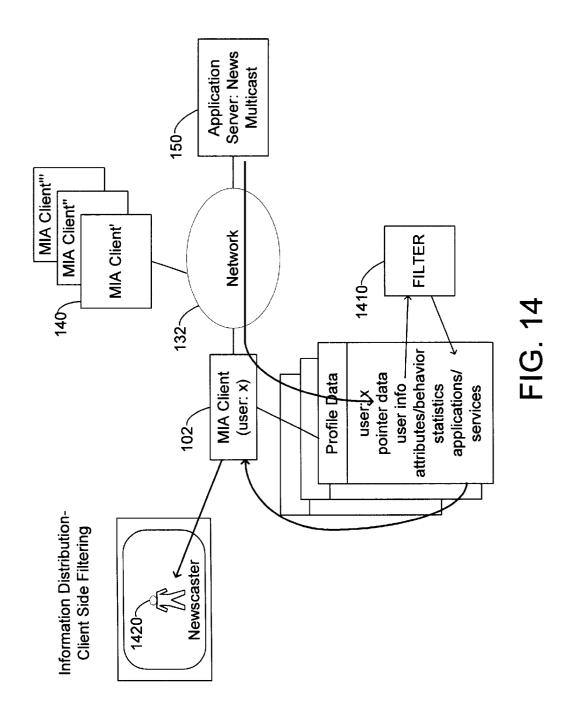
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Information Distribution-Server Side Filtering



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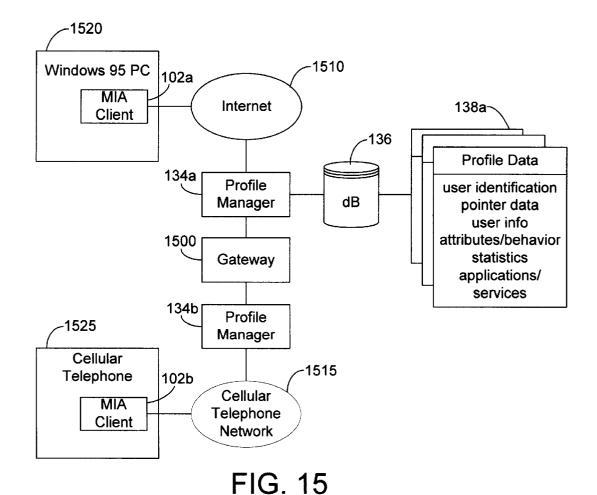
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SYSTEM AND METHOD FOR IMPLEMENTING AN INTELLIGENT AND MOBILE MENU-INTERFACE AGENT

FIELD OF THE INVENTION

The present invention relates generally to the field of computer networks. More particularly, the present invention is directed to an information management and storage system and method. The present invention is further directed to 10 a mobile interface agent that can be used to dynamically access resources stored either locally in the computer device or across a network including programs, applications, bookmarked URLs, user profiles, IP addresses, telephone numbers, television channels, radio stations, and the like that are specific to a user via any computer device. Moreover, the present invention relates to a per user based licensing model that allows the user to locally or remotely access and use computer programs from any computer device.

BACKGROUND OF THE INVENTION

Most computers and portable digital assistants (PDA) have an operating system (OS) such as MS-DOS, UNIX, Windows 98INT/CE, or Linux loaded thereon for managing basic operations. In general, an OS apportions the computer's main memory, handles requests, receives and transmits instructions to and from the input/output (I/O) devices, manages the flow of information into and out of the main processor and the I/O devices, and performs other tasks that are commonly known.

The OS is also used to organize and manage menu items such as software programs, applications, files, folders, documents, and the like that are stored on the computer or PDA. A user interface in an OS generally includes "pointers" to software programs, applications, files, folders, 35 documents, and other menu items. A pointer in this context is a reference to a type of menu item that can be accessible on the computer, PDA or a server.

In the current versions of the Windows 98/NT (believed to be a registered Trademark of Microsoft Corp.) OS, 40 pointers are commonly used to retrieve/access menu items. Pointers can be found in a "Start" menu bar on the Windows 98/NT user interface and includes a list of pointers to folders, files, and programs (e.g., word processing program, spreadsheet data file, personal software folder, etc.). For 45 example, FIG. 2 illustrates a screen shot of a conventional Windows NT "Start" menu bar.

The "Start" menu bar's main function is to provide easy access to commonly used applications and files. The menu bar also has some basic configuration capability so that a 50 user can personalize the pointer data by adding or removing pointer data found in the menu bar. However, the "Start" menu bar information and configuration for a particular user is limited to the personal computer on which the configudifferent personal computer cannot dynamically recreate the configuration and pointer information stored on another personal computer. Further, the menu bar does not have any intelligence about a network connected to the personal computer so a user may not receive accessibility information about pointer data that may depend on a network connection. Even further, the current Windows "Start" menu bar information cannot be accessed across multiple operating systems or platforms such as on a Macintosh computer running MacOS or within a web browser.

Even further, the "Start" menu bar keeps no user information or profile data associated with the user of the menu 2

bar. A user could save time if the menu bar kept certain user profile data, and applications linked to the menu bar could access this data. Hence, a user who accesses a word processor's Fax template could automatically have the word processor access data kept by the menu bar interface such as his name, address, and telephone number and automatically insert this information into the Fax template. Applications would simply be given some kind of interface such as a software API to query data stored by the menu bar interface, and the stored data could be assumed to be associated with the current user using the menu bar interface.

Computers in many environments are connected to a network such as a local area network (LAN), a metropolitan area network (MAN), or a wide area network (WAN). Computers on the network can conveniently manage and access software programs, applications, files, folders, documents, and the like from another computer or server. For example, most businesses store such menu items at a centralized location, e.g. central server, so that multiple ²⁰ users connected to the network can gain access to them.

Another popular and common use of a computer or PDA is to access information on the Internet. A web browser such as the Internet Explorer 4.0/5.0 (believed to be a registered Trademark of Microsoft Corp.) or Navigator (believed to be a registered Trademark of Netscape, Inc.) is loaded onto the computer or PDA so that the user can access web sites. The web browser is also used so that the user can receive and transmit data. Because the user may visit many web sites during a given session, each web browser allows the users to store and save the addresses (URLs) of commonly visited web sites. This is done by bookmarking them. The user bookmarks commonly visited web sites so that the user can create shortcuts for future use. As a result, the user does not have to type the complete URLs to access these sites.

It is not uncommon for many users to have multiple computers, PDAs, and other computer-related devices. Each individual computer or PDA may include specific menu items and bookmarks that do not exist in another computer or PDA. For example, a computer used at work may be the only device that includes a spreadsheet program while a computer used at home may be the only device that includes bookmarked URLs. Thus, the user will not have access to the bookmarks from the user's work computer and likewise, will not have access to the spreadsheet program from the user's home computer. As a result, this causes much inconvenience and inefficiency for the computer user.

Further, the bookmarks pointer data is specific to a particular output interface; specifically, the web browser. It would be desirable to have bookmarks that can attach various types of output applications for the pointer data contained in the bookmarks. It would also be desirable to be able to attach various types of interfaces to the bookmarks themselves instead of being tied as a feature of a web ration and pointer information reside. Hence, a user using a 55 browser: an independent entity that can optionally attach various kinds of user interfaces such as some kind of intelligent agent using a graphical icon of a human-like figure (for children to interact with on a Windows 95/98 PC) or a voice activated and controlled menu system (for cellular telephones).

It is common for users to have two computers of two different OS's running an application such as Microsoft Word. In order to share a particular Microsoft Word data file, it is currently necessary in the prior art to manually export 65 the file in the required format so that a computer using one OS can read the file of the computer using the other OS. Time would be saved if there existed a mechanism allowing

files to be exported to the network in a format specified using mobile interface agent application data. When the mobile interface agent running on one OS changes to a computer running a different OS, the mobile interface agent can signal a server daemon to perform an OS conversion of the data 5 and get the data file in the proper format. To the user, this process would be automatic and transparent since the user can simply click a data file, which is a pointer data in his/her mobile interface agent.

Currently, users may save a list of phone numbers on her personal computer's telephone directory software. Similarly, a user may go to a television guide web site and save a list of favorite television shows and times. Time and effort could be saved if the list of phone numbers were transparent to the user's telephone and the list of favorite television shows transparent and accessible to the user's television. In other words, besides the advantage of being cross platform, using the mobile interface agent system allows user profile, configuration and settings information to be handled intelligently by network services to export information between networks such as the Internet, cable television network, or 20 access user configuration and settings information. telephone network. This allows not only cross platform advantages, but cross network advantages as well.

Most software programs and applications are currently licensed on either a node locked paradigm in which the software is usable on a per device basis or as a floating 25 license in which a fixed number of licenses are available to a certain group of users limited by the number of concurrent users. In the case of node locked licensing, a user is generally not allowed to install a software program in multiple computers unless a software developer grants a license to the user for such use. Thus, most users cannot install the same software program on both their home and work computers unless the user purchases two identical programs (one for home and one for work). For floating licenses, the number of instances of program execution is tracked and any additional attempt to execute a program above the licensed limit is blocked by some kind of license manager. However, this method does not allow the tracking of the usage of specific users and involves guessing an optimal number of concurrent licenses to purchase so that users are not blocked from using the program while mini- 40 mizing the cost of the licenses. Also, current licensing models are generally restricted by platform so that a user with a license for a software program is allowed to re-install the program when the user is changing/upgrading computers of the same platform. However, when the user is changing 45 to a different platform such as from a Windows 98 device to an Apple MacOS device, the re-installation is not possible.

The trend in the future is that many software programs and the like may be licensed per user rather than per device/platform or number of concurrent users in a network. In this case, the user has a license to use such programs from any computer that is capable of running such programs. The present invention provides a system and method for implementing such a licensing model so that the user can access graphical location.

Accordingly, the ability to dynamically access any software programs, files, documents, URL bookmarks, IP addresses, telephone numbers, television channels, radio stations, and the like from any computer is highly desirable. There is a need for a system and method that can provide access to such menu items and bookmarks using any computer.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a system and method that allows a user to access specific documents,

files, programs, applications, URL bookmarks, IP addresses, telephone numbers, television channels, radio stations, and other menu items from any computer device located in any geographic location.

It is another object of the present invention to provide a system and method that allows a user to access specific documents, files, programs, applications, URL bookmarks, IP addresses, telephone numbers, television channels, radio stations, and other menu items using a mobile interface 10 agent.

It is yet another object of the present invention to provide a system and method that allows different applications or services to share information between them.

It is another object of the present invention to provide a system and method that allows applications and services to access user profile information.

It is another object of the present invention to provide a system and method that allows applications and services to

It is another object of the present invention to provide a system and method that allows a mobile interface agent to be accessible by a user using any computer type device connected to the network.

It is another object of the present invention to provide a system and method that allows an intelligent platform or OS conversion of documents, files, or other data that are listed in mobile interface agent pointer data.

It is another object of the present invention to provide a system and method that allows a mobile interface agent to be accessible by a user using any digital communication device such as a cellular phone or a cable set top box that is connected to the network.

It is another object of the present invention to provide a system and method that allows a profile manager to export a user's profile, configuration, or settings data from one communications network such as the Internet to another network (such as the cellular phone network or the cable television network) to be accessible by mobile interface agents or other software or devices on the other network.

These and other objects of the present invention are obtained by providing a network based mobile interface agent. The mobile interface agent can be accessible using a computer, cable set top box, cellular phone, or other device from any geographical location. Once the mobile interface agent has been accessed, the user can gain access to any documents, files, programs, applications, URL bookmarks, and other pointer data that are available to the user. The mobile interface agent is basically an agent that allows the user to access documents, files, programs, applications, URL bookmarks, IP addresses, telephone numbers, television channels, radio stations, and other menu items from any computer that is connected to a network. The present invenand run programs from any computer and from any geo- 55 tion also provides a method for remotely accessing and using computer programs from any computer device based upon a per user licensing model.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects and advantages of the present invention will become apparent and more readily appreciated from the following detailed description of the presently preferred exemplary embodiment of the invention taken in conjunction with the accompanying drawings, of which:

FIG. 1a illustrates a user login screen associated with a mobile interface agent in accordance with the present inven-

- FIG. 1b illustrates a graphic interface used by a mobile interface agent once a user has logged on in accordance with the present invention;
- FIG. 2 illustrates a screen shot of a conventional Windows NT "Start" menu bar;
- FIG. 3 illustrates a block diagram of an information and storage system implementing a mobile interface agent in accordance with the present invention;
- FIG. 4 illustrates a detailed block diagram of a mobile interface agent in accordance with the present invention;
- FIG. 5 illustrates a detailed diagram of a profile manager interacting with a mobile interface agent in accordance with the present invention;
- interface agent, the profile manager, and the application/ services server in accordance with the present invention;
- FIG. 7 illustrates a state diagram for the mobile interface agent in accordance with the present invention;
- FIG. 8 illustrates an implementation of the present invention using multiple platforms;
- FIG. 9 illustrates an implementation of the present invention using multiple application/service servers;
- FIG. 10 illustrates a flow chart for initializing and creating $_{25}$ a mobile interface agent in accordance with the present invention;
- FIG. 11 illustrates a flow chart for synchronizing and updating a user profile in accordance with the present invention;
- FIG. 12 illustrates a graphical mobile interface agent and a visiting graphical mobile interface agent used for educational purposes on a user interface screen in accordance with the present invention;
- FIG. 13 illustrates an implementation of the present invention having an information distribution with client side
- FIG. 14 illustrates an implementation of the present invention having a third party server communicating with the profile manager; and
- FIG. 15 illustrates an implementation of the present invention having profile managers of multiple communication networks connected by a gateway.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The preferred embodiments of the present invention will now be described with reference to FIGS. 1–15, wherein like components/steps are designated by like reference numerals 50 throughout the various figures. As noted above, conventional systems and methods for information management, retrieval, and storage can be inefficient and burdensome. The present invention overcomes the disadvantages of prior art systems and methods.

The present invention is directed to a mobile interface agent (MIA) that is used to store, distribute, and access information. The MIA is specifically used to access menu items (e.g., software programs, applications, files, folders, documents, telephone numbers, radio stations, television channels), URL bookmarks, and user profile data. The MIA is also used to periodically update or query user profile data, facilitate the sharing of memory and data structures between applications/services both local and remote, allow various types of user interfaces to be attached (voice menu system, 65 human-like graphical icon, etc.) and perform intelligent multi-platform conversion of application data.

FIG. 1a illustrates an example of a user login screen associated with the MIA that is running as software on a computer or PDA device. FIG. 1a illustrates a conventional log in window showing a userid dialog box for inputting the userid code and a password dialog box for inputting the user's pre-selected password code. Once the correct userid and password codes are inputted into the two boxes, the user can now access and use the MIA. Once the user has successfully logged in, a graphical interface such as that illustrated in FIG. 1b is displayed to the user. Although FIG. 1b illustrates one such user interface that may be used in the present invention, other interfaces having different menu items than those illustrated herein may be included. As described in more detail later herein, the menu items/ FIG. 6 illustrates the relationships between the mobile 15 pointers shown in the user interface can be used to access and retrieve user specific resources and information.

> FIG. 3 illustrates a block diagram of an information and storage system implementing an MIA in accordance with the present invention. The diagram illustrates three sections of $_{\rm 20}$ the overall system. Section 104 represents user input/output (I/O) components of a user interface that can be used with the present invention. Section 106 represents a local memory that is used to store profile data for a particular user. Section 108 represents a network that is accessible by a computer (standalone, LAN, MAN, WAN), a PDA, a television (cable network), or a cellular phone (cellular network). Other networks that are accessible using different electronic devices that are now specifically mentioned herein can also be used with the present invention.

The MIA 102 interfaces the three sections (user I/O section 104, local memory section 106, network section 108) of the system. The MIA 102 is used to manage, access, retrieve, etc. information from the network and local memory. The MIA 102 is also used to initiate programs, applications, URL bookmarks, and other menu items, and can be implemented by way of software, firmware, or hardware.

The MIA 102 receives input commands through an input interface 110 and transmits output information through an 40 output interface 112. Several methods of inputting commands via the MIA 102 can be used with the present invention. For example, the user can input commands via an action command 114. The action command 114 can be an action such as dragging and dropping a document, folder, 45 etc., or selecting and clicking a specific menu item. The action command 114 is generally performed using a conventional keyboard, mouse, or pad. The user may also input commands to the MIA 102 via a voice command 116. A voice recognition program is commonly used to provide the capability to input the voice command 116. Examples of voice commands are the following: "MIA, what time is it?" or "MIA, find a Korean restaurant within 5 miles from my home." As another example for cellular phones, the MIA 102 could accept voice commands such as "Call Mom" or "Send phone conversation to my E-mail". Another type of input command that can be used is a scheduled event command 118. An example of the scheduled event command 118 includes launching certain applications at a specified time. Also, scheduled event command 118 can launch applications with a scheduled activity such as when a system backup program is initiated. Lastly, other event command **120** includes other types of commands that are commonly associated with external agents or modules that are unrelated to the user. Examples of such other event command 120 is when one MIA attempts to contact another MIA or when a request is received from another input source other than the user (e.g., profile manager 134).

The MIA 102 will also output information in different forms. The most notable output information is when MIA 102 launches an external application 130 such as Microsoft Word or Excel. The MIA 102 can also launch an application 128 via the output interface 112. Alternatively, the MIA 102 can itself drive output to the user that includes graphics 122, animation 124, and sound/music/voice 126. In certain embodiments, the MIA 102 will use appropriate types of output for the particular device that it is running on. For example, an audio message output for a cellular telephone, text output for a television screen, etc.

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The MIA 102 is also coupled to a network 132 so that a user can access software programs, applications, files, folders, documents, services, URLs, , IP addresses, telephone numbers, television channels, radio stations, multimedia data, user profile data, other MIAs, and other items located remotely on the network. The MIA 102 can connect to the network 132 via the Internet, LAN, MAN, WAN, cable TV network, cellular phone network, etc. These items are stored either in an Application/Services (AppServ) server 150 or a master database 136. The AppServ server 150 is generally used by third parties to store applications that can be retrieved by the MIA 102 for the user or that execute other services on the network. When a computer device having the MIA 102 is connected to the network 132, the user can access applications/services from the AppServ 150 and profile data 138a from the master database 136. The user can access such information using any computer device from any geographic location so long as the user is able to connect to the network 132.

A profile manager 134 is connected to the network 132 and manages the contents of the master database 136, which includes profile data 138a. The profile manager 134 is responsible for managing and updating a user's profile data 138a that is stored in the master database 136. The master database 136 may be a part of the AppServ server 150 or can be a database in another server.

The local memory 106 includes a local database 160, which further includes a profile data 138b. Profile data 138a, 138b are stored in two locations; in the database master 136 and also in the local database 160 in a form of a "cached" copy. The profile data 138a, 138b must be synchronized for each MIA user.

When a particular user accesses the MIA 102 with a computer device for the first time on that device, a copy of the profile data 138a needs to be cached to the local memory 106. The MIA 102 will send a request to the profile manager 134 to send a cached copy of the profile data 138a to the local database 160 in order to create the profile data 138b. of the profile data 138a, 138b.

When the MIA 102 is first used, it will contact the profile manager 134 to initialize itself. From then on, the MIA 102 will periodically update and synchronize itself with the profile data 138a. The profile manager 134 will track 55 changes to the MIA 102 for a particular user.

As discussed earlier, the profile data 138a, 138b needs to be synchronized whenever possible. In certain instances when a network connection between the MIA 102 and the network 132 is not established, modifications and changes are stored in the local database 160 in the form of profile data 138b. Thereafter, when the network connection is reestablished, these modifications and changes in the local database 160 will be synchronized with the profile data 138a in the master database 136.

There may also be multiple MIAs 140 connected to the network 132. MIAs 140 may be on other computer devices or may be the same device. Each MIA is specific to a particular user or users. Network 132 can also be used to transfer information, files, data, applications, etc. between the MIA 102 and other remote MIAs 140. For example, the MIA 102 that is specific to user X could be used to transmit

information to another user Y through MIA 140.

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There are countless uses of the present invention. For example, the present invention can be used to conduct online financial transactions more efficiently. The MIA 102 can be used to allow multiple financial transactions using billing or bank information specific to the user. Another implementation would be to use the user profile on the network for online advertising or promotional services. Yet another implementation would be for an application to check whether any or certain other applications are running concurrently. For instance, a chat/messaging program can check to see if a user is running any educational or instructional applications before sending a message or chat request to the user. A word processing program could be used to automatically look into the user profile database and pull out the user's address and name and automatically insert this information into document templates for a letter, resume, etc.

The profile data 138a, 138b includes information relating to different fields of a particular user. These fields include a user identification 170, pointer data 172, user information 174, attributes/behavior 176, statistics 178, and applications/ services 180. First, the profile data 138a, 138b includes a user identification field 170 for identifying a particular user. For example, identification codes such as "jokim123" or "11234678" can be used so that the MIA 102 can identify the code with a particular user.

Pointer data 172 can be used to quickly access an application, service, or other menu item. The pointer data 172 is similar to bookmarks used in web browsers, but can include more than URLs. For example, pointer data 172 can be used to retrieve and access documents in multiple formats, applications, application data, images in various formats, etc. The pointer data 172 can also be used to properly display pointers. For example, a URL pointer will include data of the browser location such that the browser is launched when a particular URL is requested. Pointer data 172 may exist either locally in the computer device or may exist as a resource accessible across a network.

User information 174 includes user information such as name, age, sex, address, occupation, salary, etc. This information is updated continuously as the data changes with the particular user.

Attributes/behavior information 176 includes information Information specific to a particular user is stored in the form 50 and data relating to the user interface. This information includes graphics and animation data specific to a particular user interface. For example, attributes and behavior data are used to create a user interface that is more personal to the user. Attributes include specific characteristics such as strength, charm, etc. that can be used to represent the user through the user interface. For example, an attribute could be a type of character such as a teddy bear that the user interface will use to graphically representation himself/ herself. User behaviors such as playful, cute, or sarcastic can also be used to create an interface that interacts with other users in a particular manner. Inputting a particular attribute/ behavior into the user interface allows the user to interject artificial intelligence to the user interface.

> Statistics information 178 includes data such as how 65 many times a particular menu item has been accessed or the number of times a particular advertisement has been accessed. Examples could include the number of cyber

dollars used in e-commerce transactions or the amount of time the user was connected to the Internet.

Applications/services data 180 includes the MIA specific data required by the applications/services. This includes application and services data using the user interface, licensing information for applications, user and password information to access network services, and any data related to the MIA that an application or service would like stored.

Applications/services data 180 include any data required by a particular application or service associated with the menu user interface. For example, a service that provides children's stories in audio form through an animated character can be stored in the story data in a data structure of the MIA 102. Another example would be for an application such as Microsoft Word (believed to be a registered trademark of Microsoft, Inc.) to be able to store the number of times that the program was accessed and for how long. The previous example would be beneficial where the copy of Microsoft Word was stored across a network and the client using an MIA was paying to use the Microsoft Word application on a per usage basis.

Next, applications or services (such as external application 130)can have the ability to query or modify data relating to profile data fields. For example, when a user is running educational software via the MIA 102, the user can set a variable in the attribute data field 176 in the form of DO_NOT_DISTURB. This will prevent other MIAs 140 from interrupting the user until the user has completed the session. For example, when another MIA 140 user requests a chat session with the MIA 102 user during the educational session, the DO_NOT_DISTURB variable is presented to a chat application. The chat application can then disable notifications for incoming chat requests or queue the request until the MIA 102 user has completed the educational session. Other types of locks and semaphore data could similarly be established within the attribute or other fields.

Profile data 138a and 138b can also be shared among other applications or services. Using the example described above, a child's story service can store which stories were accessed by a particular user through the MIA 192. This type of information can be provided to, for example, a toy manufacturer, which can then use the information to send promotional materials relating to the story to the user. The promotional materials can be sent via the Internet or traditional mail

Applications/services data **180** can be either external to MIA **102** or internal to the MIA **102**. For example, a menu item can be built into the MIA **102** called "recommend," which can include options such as "Chinese restaurant." The MIA **102** can also check for other information regarding the user's preference from the profile data **138a**, **138b**. For example, the user may include in the profile data **138a**, **138b** that he/she enjoys spicy food. In this case, the name and location of a Chinese restaurant located near the user that serves spicy food will be displayed to the user. In another example, a menu item such as "Sing" can be used to animate the graphical user interface agent to play music or sing while the character is shown on the screen. As can be appreciated, there are countless applications and uses associated with the profile data **138a**, **138b**.

FIG. 4 illustrates a detailed block diagram of an MIA in accordance with the present invention. In one embodiment of the present invention, the MIA 102 includes a controller 200, a pointer resolver 206, a scheduler 208, an output filter 65 210, a connection detector 212, a network interface 214, an application server interface (AppServ interface) 216, and a

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profile filter 218. The controller 200 is coupled to the input interface 110 and the output interface 112 via the output filter 210. The controller 200 receives input commands via the input interface 110 and decodes them into a more compact or standardized code. The controller 200 then processes the input commands in order to determine how to respond to them.

As discussed earlier, a pointer is a link/shortcut to an item such as a file, URL, IP address, telephone number, television channel, radio station, application, or service. When a user activates a pointer using one of the input commands, this command signal will be transmitted to the pointer resolver 206 via the input interface 110 and the controller 200. The pointer resolver 206 then receives the decoded input commands and accesses the corresponding item. For example, a URL access may launch a web browser or a word processing document will launch the word processing software/application.

The MIA 102 can also have menu functions or applications to schedule certain actions to be performed at specified periods. The scheduler 208 is used to queue requests for certain actions to be executed at specified periods. For example, the MIA 102 can have a backup application that backs up certain files weekly at a specified time, or an application that connects to the Internet and loads certain URL pages for later viewing, or a video cassette recorder that records a user's favorite television shows.

The output filter 210 is used to enable/disable functionality accessible by the user depending on various state information. For example, access to a particular service initiated via a menu item may be disabled using the filter 210 if a user has not paid for the particular service. As another example, when the connection detector 212 detects that there is no network connection, URL data present to the user as menu items may be made inaccessible or invisible to the user. As yet another example, a multicast video stream including various news segments could be sent to the user. The video stream would be tagged with special codes indicating what kind of news it represents. The output filter 210 would disable video news segments from being displayed on the user's output screen that did not match the user's indicated preferences stored in the profile data 138b. The network interface 214 is used to connect the controller 200 to the network 132.

Also depicted in FIG. 4 as part of the MIA 102 is the AppServ interface 216. Applications/services may share data or access a user's MIA profile data 138b via the profile data filter 218. The AppServ interface 216 is used to access profile data 138b by applications or services. AppServ interface 216 is preferably a software API with library functions used to write and read appropriate information. Security levels could also be implemented to allow the user to select the level and kind of information accessible to a particular application. Further, applications and services will have an interface to change, write and read data into a user's profile data 138b. In a similar way, an interface may also be provided to directly access profile data 138a stored on the network

The controller 200 will write and read data to the profile data 138b for a particular user and also control access to this data by applications and services through the AppServ interface 216. The profile data filter 218 is used by the controller 200 to restrict various data from being written to the profile data 138b. The profile data filter 218 could also be used for non-security reasons. For example, if a multicast data stream were sending news information, then the profile

data filter 218 could be programmed by the controller 200 based on rules supplied by the user's profile data 138b to

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only write certain news items to be read by the user at a later time.

FIG. 5 illustrates a detailed diagram of a profile manager interacting with a mobile interface agent in accordance with the present invention. The embodiment depicted herein is based on the UNIX BSD Sockets interface. One skilled in the art can easily implement other socket interfaces in accordance with the present invention.

When the MIA 102 and the profile manager 134 are interacting, the MIA 102 can obtain profile data from the profile manager 134 that is stored in the database 136. Also, profile data 138a can be updated and synchronized during such interaction. Finally, the MIA 102 can request information from the profile manager 134 such as the IP address of a server for a particular service, information about another user, online connection status for a list of contacts, etc.

During operation, a user 300 first inputs a command to the MIA 102. If such command requires the MIA 102 to interact with the profile manager 134, then an initial request is sent to the profile manager 134 from the MIA 102. This request is received by a profile manager server daemon 310 that is listening on a specific port. The parent daemon 310 then forks a new child process 312 to handle further interactions with the MIA 102. The child process 312 then handles subsequent requests from the MIA 102. The embodiment depicted herein uses a UNIX sockets system. In a similar fashion as the MIA 102 and profile manager server daemon 310 relationship, the profile manager child process 312 sends a request to a SQL database engine daemon 314 through another specific port. The database engine daemon 314 then forks a SQL database child process 316 to handle any queries from the profile manager child process 312. The SQL database child process 316 then interacts with the profile data database 136 and handles queries, directives, or modifications to the profile data 138a.

In some embodiments, the profile manager 134 uses a referral system such that a single server does not maintain all of the user profile data, but is rather distributed throughout multiple and redundant servers. The referrals will be passed back to the MIA 102 that will then query the next profile manager servers 320.

FIG. 6 illustrates the relationships between the MIA, the profile manager, and the application/services server in accordance with the present invention. The MIA 102, the profile manager 134, and the AppServ server 150 can interact directly/indirectly with each other.

The following examples describe a sample of the commands/responses between the MIA 102, profile manager 134, and the AppServ server 150. The MIA 102 will interact with the profile manager 134 when a user is connected to the profile manager 134 when a network connection is present and MIA needs to access the profile manager 134. The profile manager 134 will then respond to the MIA 102 in step 402 by authenticating the user code so that the MIA 102 can also transmit a request 420 to the profile manager 134 to update/ synchronize the profile data.

134 is requested, then the MIA 1 connection in state 540 and if the check for the new profile data on state 542. The MIA 102 will then 134 in state 544, and clear the profile manager 134 will then respond to the MIA 102 in step 402 by authenticating the user code so that the MIA 102 can also transmit a request 420 to the profile manager 134 to update/ synchronize the profile data.

When calling up applications/services, if the MIA 102 cannot locate the application/service requested on the local device, the MIA 102 will interact with the profile manager 134 before requesting the actual application/services from the AppServ server 150. For example, the MIA 102 will send a request 430 to the profile manager 134 to determine the utilize the results of that particular network, the appropriate server 150.

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location of the desired application/service on the network. The profile manager 134 will then respond in step 432 with the location of the application/service. The MIA 102 uses this information to send a request 434 to the AppServ server 150 to initiate the application/service. The AppServ server 150 will then initiate the application/service in the response 436.

One of the advantages of the present invention is that it allows a licensed program/service to be accessible for a particular user on a per user basis, without regard to platform, and anywhere in the world rather than on a particular machine. The licensing aspect of the present invention can be implemented in different ways. The preferred embodiment depicted herein shows the AppServ server 150 interacting with the profile manager 134 for a particular user's licensing information. Once the MIA 102 requests an application/service in request 434, the AppServ server 150 communicates with the profile manager 134 to check the licensing information in step 440. After the profile manager verifies that the user is licensed to use the requested application/service in step 442, this verification is sent to the AppServ server 150 and/or MIA 102. The AppServ server 150 then returns the application/service to the MIA 102. Alternatively, the MIA 102 could directly send the licensing information to the AppServ server 150. The AppServ 150 can also access and/or modify the profile data managed by the profile manager 134 in step 450.

FIG. 7 illustrates a state diagram for the MIA in accordance with the present invention. After the start state 500, the MIA 102 enters the initialization state 510 where routine initialization is performed. In addition, MIA 102 will check to see whether it is connected to the network. If it is not connected to the network, then the MIA 102 may disable network dependent menu items such as URLs or applications that are on the network. Similarly, MIA 102 will check to determine what computer device it is on and based on the device's profile and list of registered applications, it will enable local applications and services that are available.

After the initialization state 510, the MIA 102 will then 40 enter "event handler" state 520. In this state 520, the MIA 102 waits for an input such as an action command 114, voice command 116, scheduled event command 118, or other event command 120. When an input command is received by the MIA 102, the command is decoded. Then, based on the kind of input command received, an appropriate handler will be activated. For example, if a menu item is selected to be modified, added, or deleted, the MIA 102 will enter state 530, which will handle the modification of the menu item. Another example is when an update to the profile manager 134 is requested, then the MIA 102 will check for a network connection in state 540 and if the connection exists, it will check for the new profile data on the profile manager 134 in state 542. The MIA 102 will then update the profile manager 134 in state 544, and clear the request to update/synch

If the user selects a menu item, then the MIA 102 will enter state 550. In state 550, the MIA 102 will check the menu item and dereference a particular pointer. For example, if it is a URL, then the MIA 102 may launch a web browser with the requested URL. If, on the other hand, a local application is selected, then the MIA 102 will launch that particular application. For an application residing on the network, the MIA 102 will locate the application and send the appropriate request for the application to the AppServ server 150.

For some other kind of input command that does not utilize the menu item interface, an appropriate event handler

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will be called. This could take the form of, for example, the menu interface having a different graphical look, or it could be dragging the menu interface onto a trash can icon to log the user out of the MIA 102.

FIG. 8 illustrates an implementation of the present invention using multiple platforms. A first platform 600 represents a computer device using a Windows based OS and the second platform 610 represents a computer using a Mac based OS. This figure illustrates how MIA 102 can be used both on a PC system 600 at a first location and also on an Apple Macintosh system 610 at a second location. Stated broadly, the user can connect to the network 132 and profile manager 134 using the MIA 102 from any computer and location.

When a user implementing the MIA 102 transfers from one computer device to another, then a pointer data that is accessible via network 132 may be valid and kept intact. However, pointer data to local applications may no longer be valid and will be filtered. Also, local applications may require their pointers readjusted if those local applications were resident on the local machine. For example, MIA 102 could have a pointer to Microsoft Word program in location 1 on the Windows 95 machine but can not resolve that pointer now that the user has moved to location 2 on the Apple Macintosh machine. Thus, the MIA 102 may search for Word locally on the Macintosh and adjust the pointer to point to the copy of Microsoft Word on the Macintosh. Further, this allows licensing to be carried with a particular user rather than the software. Hence, the MIA 102 can carry the licensing information for the user and may thus access Microsoft Word on any machine so long as his/her MIA has the proper license. Further, the application could alternatively be accessed via network.

In the case of a network-connected application or some kind of services, AppServ server 150 is connected to network 132, and the MIA 102 may access applications or services remotely. There may exist a plurality of AppServ server 150 on the network 132. Hence the MIA client 102 could request applications directly from some third party applications server 150. An example would be if MIA 102 was running on a Sony Playstation-like device and the user had purchased a license for a particular game. The third party application server (e.g., Sony server) can include a collection of Sony Playstation games 630, and the user can access a copy of the licensed game. Further, the application server could carry all types of applications or services including PC applications 632 or Apple MacOS applications 634. So the user in the second location could request Microsoft Word from the application server 150 and either download the application and run it locally or the application could be run remotely and the display interface returned to

When a user saves a MS Word document from the Windows 95 PC 600 in the profile manager 134 and then 55 later attempts to access the MS Word document from the Apple MacOS machine 610, another feature of MIA is that since it is able to detect/know the platform it is running on and has information about the format of documents that reside on the profile manager, MIA can request a document from the Apple MacOS machine 610 that is converted by the profile manager 134 to the proper format.

FIG. 9 illustrates an implementation of the present invention using multiple application/service servers. The MIA 102, network 132, profile manager 134, profile database 136, 65 and the profile data 138a are similar to those described with reference to FIG. 3. In FIG. 9, however, there is shown

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multiple AppServ servers 150a, 150b. This allows the MIA 102 user to access applications/services via any AppServ server that are connected to the network 132. Each AppServ server 150a, 150b can gain access to the profile data 138a for user information.

Further, applications or services can use MIA's user profile information to add value and functionality. Application 1 900a and application 2 900b can both access a user's profile data as well as shared locks, variables, memory segments, or other data stored in the profile data 138a. For example, a user could use an application 1 900a called global status that sets the user's status information such as "working" or "away" or "do not disturb". Other applications that describe a user's state information such as Mirabilis ICQ (e.g. application 2 900b), which tells other online user's a particular user's status could map a user's state information set by global status to ICQ status and automatically set ICQ status to match global status information.

FIG. 10 illustrates a flow chart for initializing and creating a mobile interface agent in accordance with the present invention. In step 800, a user will input a user id number and a user password to begin accessing the MIA. The user can connect to the logon screen via the Internet or any other network connection. An example of a sample logon screen was illustrated in FIG. 1a. A user enters his ID and password on any machine of any platform that can implement the MIA 102. The option bar may be used to spawn another MIA client or to implement other features accessible outside of user login. Alternatively, the user may have a pre-configured ID associated with a device such as in the case of a cellular phone and thus may not require keyed input of a user ID.

Once the user has logged on, FIG. 1b again illustrates a graphic interface used by a MIA 102 once a user has logged on. In this example, a set of menu's associated with a user's specific configuration and profile is shown. MIA options are accessed through the menu system. In addition to a simple menu interface, a user can elect to associate a graphical icon such as a teddy bear graphical icon or other figure to the menu system.

Next, the system implementing the MIA 102 will determine whether a profile exists on the local computer for the user in step 810. If a user profile does not exist for the user, then a profile is created locally for the user in step 820. After creating the initial user profile, the next step is to determine whether the network connection is established in step 830. In step 850, if a network connection has been established, the MIA 102 contacts the profile manager 134 and determines whether the user id and password entered in step 800 is registered, unless the user has selected an option to not authenticate on each use. If the user is authenticated, then the MIA 102 downloads the appropriate information such as user profile, URL links, applications registered, etc. Some of the information downloaded may depend on the platform, geographical location, etc. that corresponds to the user's connection location. For example, if a user has purchased a Windows 98 only license for MS Word and moved to an Apple MacOS device, then the MS Word menu item may be disabled or not downloaded. As another example, if a user using a cellular phone has not purchased the *69 callback feature then the voice command "Callback" may be disabled. As yet another example, if the user is shown to be connecting from an IP address known to be in a certain geographical region, or if the user has entered geographical information of a certain country, then advertising information specific to that country or region can be downloaded. The subset of information downloaded can depend on quite a number of variables and downloaded information may be filtered even further by filter 210.

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If, on the other hand, the network connection in step 830 is not established, then the MIA 102 sets some status to indicate that there is a need to synchronize and update the operating parameters in step 840.

If the system determines that a profile exists in step 810, the system checks to determine whether the operating parameters need to be synchronized and/or updated in step **870**. If no synchronizing or updating is required, then the appropriate output based on state variables such as network connection, platform, or geographic region of MIA is transmitted to the user based on the user profile data in step 950. If, on the other hand, the system determines that operating parameters need to be synchronized and updated, the system determines whether a network connection is established in step 880. If no network connection is detected, then the MIA 102, in step 890, will set state information requiring the MIA 102 to synchronize/update it's profile information with the profile manager 134 once a network connection is detected. If the network connection has been detected, then the MIA 102 will, in step 900, contact the profile manager 134 and 20 download all of the required user profile, application, etc. data. In step 910, the profile manager 134 may update it's own information such as last log in time, last connected IP address, last synchronization time, etc. Thereafter, an appropriate output is displayed to the user is step 950.

FIG. 11 illustrates a flow chart for synchronizing and updating a user profile in accordance with the present invention. This flow chart illustrates the process for synchronizing and updating a user profile data that is stored in the profile manager database and in the local memory database using the MIA.

In step 1000, the MIA will contact the profile manager and check the serial number and/or date of the last modification listed in the profile manager database. If the MIA serial number or date is older than the most recently updated serial number or date in step 1010, the MIA may be configured to not update or synchronize it's information in step 1020. If, on the other hand, the MIA serial number or date is not older, then the MIA profile data is updated with the profile manager profile data in step 1030. After such updating, setting the MIA's update/synchronize status is not necessary as indicated in step 1020.

FIG. 12 illustrates a graphical mobile interface agent on a user interface screen in accordance with the present invention. A graphical figure representing a MIA 1220 and a home 1210 is displayed in the screen 1200. Left clicking on the MIA 1220 will display the list of MIA menu options shown in FIG. 1b.

Also illustrated is a visiting MIA 1230 named Professor 50 Math. This MIA has a subset of MIA functionality and can be used to access specific options such as executing a link to a lesson such as an Algebra Tutor application 1250. The visiting MIA 1230 could first appear and "knock" on the MIA home 1210 to gain access. to a user's desktop 1200. 55 The user may then have a list of available responses such as: (1) allow Professor Math 1230 to enter; (2) ask Professor Math 1230 to go away; or, (3) send a message to Professor Math 1230 to come back later. Educational lessons can be downloaded to a MIA's 1220 local site or can be remotely accessed via the visiting MIA 1230.

By associating a lifelike graphical icon such as the MIA 1220 character attributes can be associated with the MIA such as strength, personality, etc. Further some kind of status bar could be provided with information concerning the MIA 65 1220 as well as other MIAs. The MIA status bar could also include advertisements from advertisers.

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FIG. 13 illustrates an implementation of the present invention having a third party server communicating with the profile manager. In this embodiment, information distribution is performed on the server side. The example provided herein shows advertisement servers 1310 coupled to the profile manager 134. The ads will have characteristics and keywords associated with them. The ad server 1310 via the profile manager 134 checks the profile data 138a to determine whether users want advertising and if so what 10 kinds of advertising they are interested in. The user information can be very sophisticated and be used to target a very specific audience. A filter 1300 is used to determine which users receive what advertisements. Then the Ad server 1310 places links in the profile data 138a specifically in his/her applications/services area about advertising information. The links will be pointers to the full advertisement in Ad database 1320. The MIA 102 then at some later point can retrieve particular ads and display them to the user through an output source.

FIG. 14 illustrates an implementation of the present invention having an information distribution with client side filtering. In this example, the AppServ server 150 is serving a news feed via a multicast connection to MIA 102 as well as a plurality of other MIAs 140 through the network 132. The MIA 102 accepts the multicast stream but filters the data based on Profile Data 138b kept in the MIA's local memory 106. Thus only a desired subset of multicast news stream data is stored into the local applications/services memory by filter 1410. Later a user may launch a news program in which a newscaster 1420 reads the news stored in local memory 106. The environment the newscaster reads news from could be a PC desktop, a set top box, a mobile telephone, or any other environment that the MIA 102 can run.

FIG. 15 illustrates an implementation of the present invention having profile managers of multiple communications networks connected via a gateway. In this example, a MIA 102a is running on a Windows 95 PC 1520 connected to the Internet 1510. The MIA 102a connects to the profile manager 134a via the Internet 1510 and saves a list of telephone numbers inputted by the user to her MIA 102a. The telephone numbers are subsequently stored in the profile manager database 136 and into the user's profile data 138a.

The gateway 1500 is used to interface certain user profile information or application data from the profile manager 134a connected to the Internet 1510 to the profile manager 134b connected to the cellular telephone network 1515. The cellular telephone network 1515 is connected to MIA 102b which resides as part of the cellular telephone 1525. In this example, the MIA 102b can download the telephone numbers that a user using MIA 102a had originally inputted in her Windows 95 PC 1520 to program telephone numbers accessible via the cellular telephone 1525.

Similarly, this concept can be extended to other types of networks. For example, a user can use a listing of television program listings configured on a MIA running on a PC connected to the Internet to program a cable set top box on a cable television network. As another example, a cable set top box user on a cable television network could use a MIA to record viewing habits. This information could later be transferred from the cable television network profile manager, via a gateway, to a profile manager running on the Internet and be used to determine the types of web banner advertising a user would be interested in viewing.

In the previous descriptions, numerous specific details are set forth to provide a thorough understanding of the present

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invention. However, as one having ordinary skill in the art would recognize, the present invention can be practiced without resorting to the details specifically set forth.

Although only the above embodiments have been described in detail above, those skilled in the art will readily appreciate that many modifications of the exemplary embodiment are possible without materially departing from the novel teachings and advantages of this invention.

L claim:

- 1. A method for retrieving user specific resources and information stored either on a local device or a network server, the method comprising the steps of:
 - retrieving a mobile interface from the network server to the local device;
 - displaying the mobile interface on the local device, the mobile interface including a plurality of pointers corresponding to the user specific resources and information; and
 - retrieving the user specific resources and information using the plurality of pointers displayed on the mobile interface.
- 2. A method according to claim 1, wherein the user specific resources and information comprise programs, applications, files, documents, bookmarked URLs, and user profiles.
- 3. A method according to claim 1, wherein the user specific resources and information comprise television channels.
- **4**. A method according to claim **1**, wherein the user specific resources and information comprise telephone numbers
- 5. A method according to claim 1, wherein the user specific resources and information comprise television program listings.
- **6.** A method according to claim **1** further comprising the step of licensing the user specific resources to a user based on a per user licensing model.
- 7. A method according to claim 1, wherein the step of retrieving the mobile interface from the network server comprises the step of retrieving the mobile interface agent user profile and configuration data via the Internet.
- **8**. A method according to claim **1**, wherein the step of retrieving the mobile interface from the network server comprises the step of retrieving the mobile interface via one of a LAN, a MAN, and a WAN.
- **9**. A method according to claim **1**, wherein the step of retrieving the mobile interface from the network server comprises the step of retrieving the mobile interface via a cellular network.
- **10**. A method according to claim **1**, wherein the step of retrieving the mobile interface from the network server comprises the step of retrieving the mobile interface via a television network.
- 11. A method for retrieving user specific resources and information stored either on a local device or a network server, the method comprising the steps of:
 - displaying the mobile interface on the local device, the mobile interface including a plurality of pointers corresponding to the user specific resources and information:
 - retrieving user profile and configuration data from the network server to the local device, wherein the user profile and configuration data is used to update the data associated with the mobile interface;
 - retrieving the user specific resources and information 65 using the plurality of pointers displayed on the mobile interface.

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- 12. A method according to claim 11, wherein the user specific resources and information comprise programs, applications, files, documents, bookmarked URLs, and user profiles.
- 13. A method according to claim 11, wherein the user specific resources and information comprise television channels.
- 14. A method according to claim 11, wherein the user specific resources and information comprise telephone numbers.
- 15. A method according to claim 11, wherein the user specific resources and information comprise television program listings.
- 16. A method according to claim 11 further comprising the step of licensing the user specific resources to a user based on a per user licensing model.
- 17. A method according to claim 11, wherein the step of retrieving the user profile and configuration data from the network server comprises the step of retrieving the user profile and configuration data via the Internet.
- 18. A method according to claim 11, wherein the step of retrieving the user profile and configuration data from the network server comprises the step of retrieving the user profile and configuration data via one of a LAN, a MAN, and a WAN.
- 19. A method according to claim 11, wherein the step of retrieving the user profile and configuration data from the network server comprises the step of retrieving the user profile and configuration data via a cellular network.
- 20. A method according to claim 11, wherein the step of retrieving the user profile and configuration data from the network server comprises the step of retrieving the user profile and configuration data via a television network.
- 21. A method according to claim 11 further comprising exporting user profile and configuration data from a first network to a second network.
- 22. A method according to claim 21, wherein the first network comprises an Internet network and the second network comprises one of a cellular network and a telephone network.
- 23. A method according to claim 21, wherein the first network comprises one of a cellular network and a telephone network and the second network comprises an Internet network.
- 24. A method according to claim 11, wherein the step of displaying the user interface on the local network comprises the step of audioly presenting the user interface on a cellular device.
- 25. A mobile interface used for accessing user specific resources and information stored either on a local computer device or a network server, the mobile interface comprising: means for interfacing any local computer device with the network server;
 - means for presenting a plurality of pointers on any local device corresponding to the user specific resources and information to a user; and
 - means for accessing the user specific resources and information using the plurality of pointers.
- 26. A mobile interface according to claim 25, wherein the user specific resources and information comprise programs,
 applications, files, documents, bookmarked URLs, and user profiles.
 - 27. A mobile interface according to claim 25, wherein the user specific resources and information comprise television channels.
 - 28. A mobile interface according to claim 25, wherein the user specific resources and information comprise telephone numbers.

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- 29. A mobile interface according to claim 25, wherein the user specific resources and information comprise television program listings.
- 30. A mobile interface according to claim 25, wherein the plurality of pointers access the user specific resources and 5 information stored on the network server via the Internet.
- 31. A mobile interface according to claim 25, wherein the plurality of pointers access the user specific resources and information stored on the network server via one of a LAN, a MAN, and a WAN.
- 32. A mobile interface according to claim 25, wherein the plurality of pointers access the user specific resources and information stored on the network server via a cellular network.
- plurality of pointers access the user specific resources and information stored on the network server via a television
- 34. A mobile interface used for retrieving user specific resources and information stored either on a local device or 20 tion stored on the network server via a cellular network. a network server, the mobile interface being adapted to move from one local device to another and adapted to be displayed on the local device, the mobile interface comprising:
 - a plurality of pointers that correspond to the user specific pointer, a user specific resource or information from either the local device or the network server is retrieved.
- 35. A mobile interface according to claim 34, wherein the user specific resources and information comprise programs, 30 communicating with the network server. applications, files, documents, bookmarked URLs, and user profiles.
- 36. A mobile interface according to claim 34, wherein the plurality of pointers access the user specific resources and information stored on the network server via the Internet.
- 37. A mobile interface according to claim 34, wherein the plurality of pointers access the user specific resources and information stored on the network server via a cellular network.
- 38. A mobile interface according to claim 34, wherein the 40 plurality of pointers access the user specific resources and information stored on the network server via a television network.
- 39. A mobile interface according to claim 34, wherein the user specific resources is retrieved based on a per user 45 licensing model.
- 40. A system for storing and accessing user specific resources and information, the system comprising:
 - a network for accessing the user specific resources and information stored in a network server; and
 - a local device communicating with the network and having a local memory and a mobile interface, wherein the local memory also includes user specific resources

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- and information, and the mobile interface includes pointers corresponding to the user specific resources and information that are stored either on the local device or the network server, wherein the pointers provide links to access the corresponding user specific resources and information.
- 41. A system according to claim 40, wherein the user specific resources and information comprise programs, applications, files, documents, bookmarked URLs, and user 10 profiles.
 - **42**. A system according to claim **40**, wherein the plurality of pointers access the user specific resources and information stored on the network server via the Internet.
- **43**. A system according to claim **40**, wherein the plurality 33. A mobile interface according to claim 25, wherein the 15 of pointers access the user specific resources and information stored on the network server via one of a LAN, a MAN, and a WAN.
 - **44**. A system according to claim **40**, wherein the plurality of pointers access the user specific resources and informa-
 - **45**. A system according to claim **40**, wherein the plurality of pointers access the user specific resources and information stored on the network server via a television network.
 - 46. A system according to claim 40, wherein the user resources and information, wherein upon initiating a 25 specific resources is retrieved based on a per user licensing model.
 - 47. A system according to claim 40, wherein the mobile interface is adapted to be loaded onto the local device from any geographical location so long as the local device is
 - **48**. A system according to claim **40**, wherein the mobile interface is permanently stored in the network server.
 - **49**. A system providing a user access to a user specific resource or information using a local device capable of 35 connecting to a network, the user specific resource or information being stored either on the local device or a network server, the system comprising:
 - means for connecting the local device to the network server;
 - means for downloading a mobile interface from the network server to the local device;
 - means for displaying the mobile interface on the local
 - means for inputting a request for the user specific resource or information through the mobile interface displayed on the local device;
 - means for retrieving the requested user specific resource or information from either the local device or the network server; and
 - means for displaying the requested user specific resource or information on the local device.

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(12) United States Patent

Anderson et al.

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(45) **Date of Patent: Jan. 21, 2003**

(54) SYSTEM AND METHOD FOR RETRIEVING INFORMATION FROM A DATABASE USING AN INDEX OF XML TAGS AND METAFILES

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Corporation, Wilmington, DE (US)

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(51) **Int. Cl.**⁷ **G06F** 17/**30**; G06F 15/00; G06F 15/16

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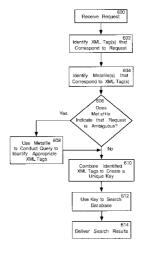
Primary Examiner—Frantz Coby

(74) Attorney, Agent, or Firm-Kilpatrick Stockton LLP

(57) ABSTRACT

Retrieving information from a database using an index of XML (eXtensible Markup Language) tags and metafiles. The index includes XML tags that correspond to domains and categories. The domains and categories are selected to facilitate searching of the database. An XML tag can have a corresponding metafile that includes XML tags for related domains and categories. The metafile can also establish a hierarchy for the tags within the metafile. Each record of the database includes an index component which lists the domain tags and category tags that are associated with the record. When a search request is received, the request is parsed to identify the terms in the request. The terms are predetermined and generally correspond to the domains and categories of the index. The terms are mapped to tags. Once the appropriate tags are identified, then the metafiles that correspond to those tags are identified. The metafiles can be used to identify additional tags that are relevant to the search. The identified tags are combined to create a unique key. The key is used to search the database to locate records that include the tags in their index component.

28 Claims, 12 Drawing Sheets

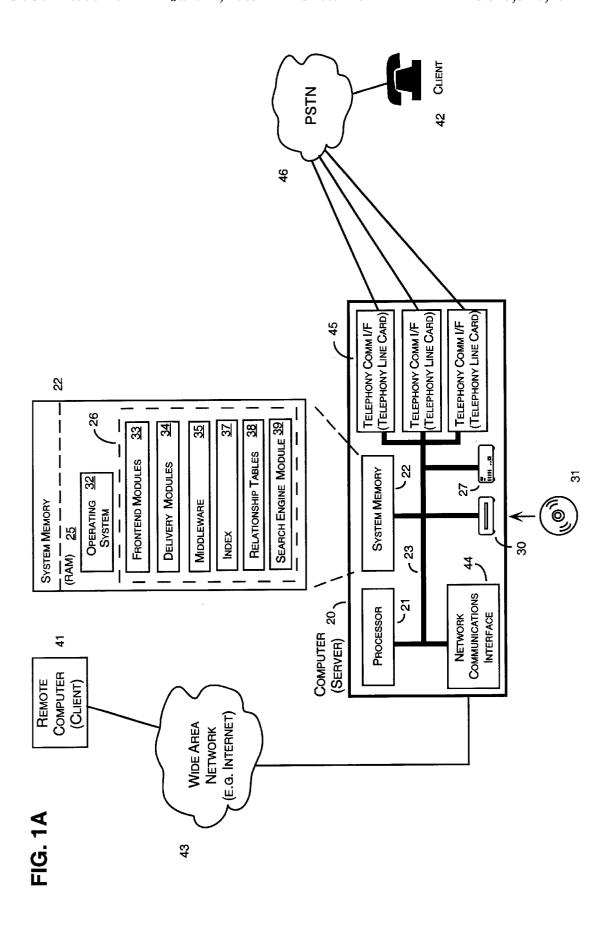


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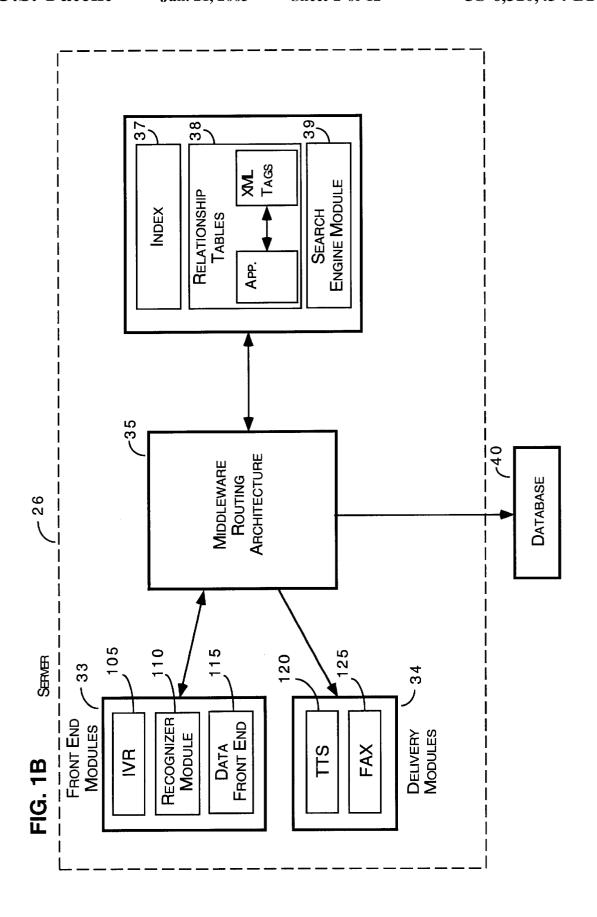
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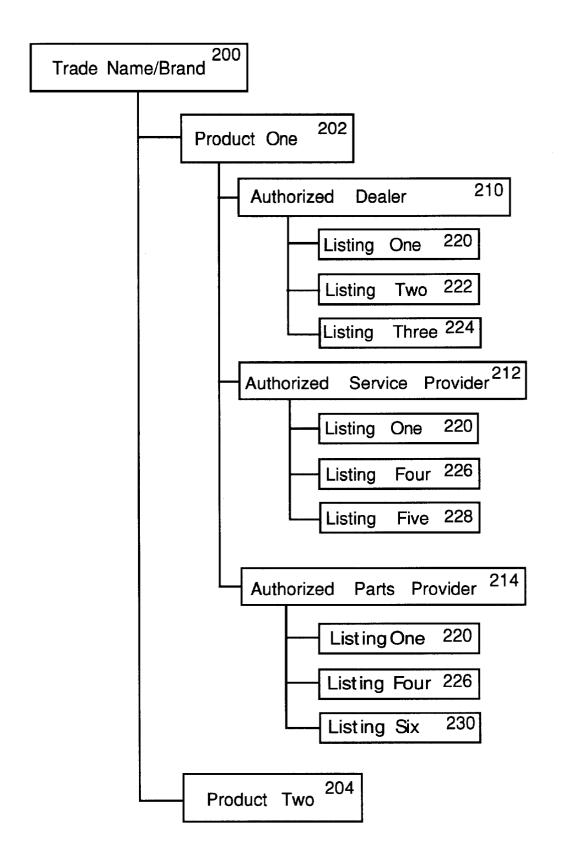


FIG. 2

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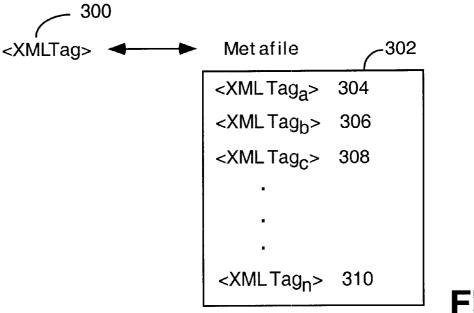


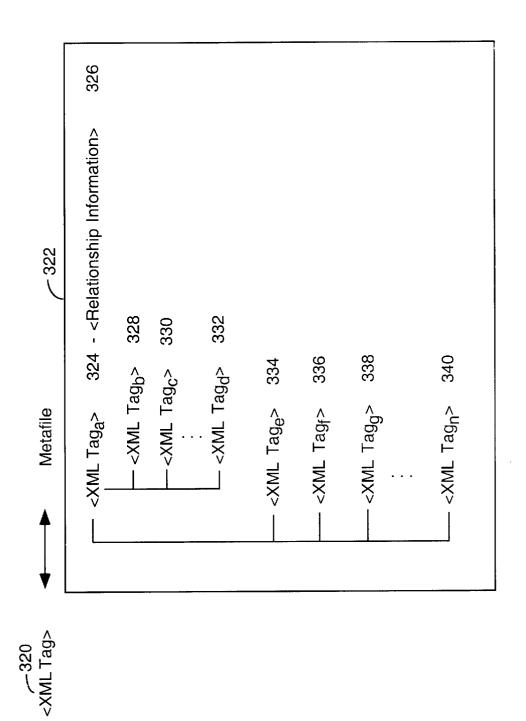
FIG. 3A

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FIG. 3E



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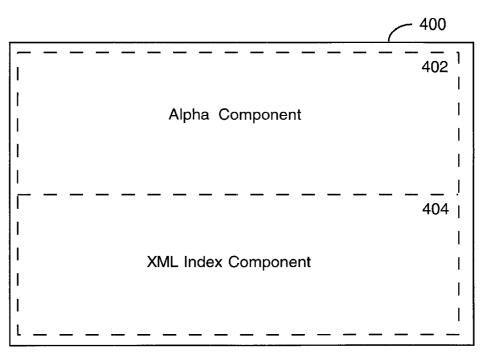


FIG. 4A

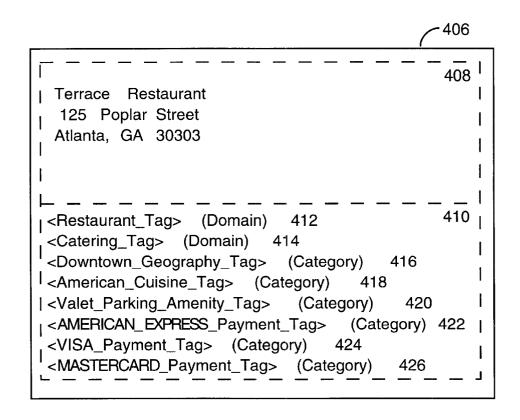


FIG. 4B

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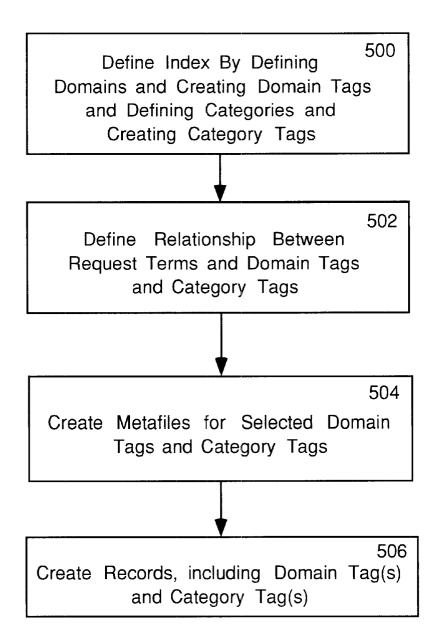


FIG. 5

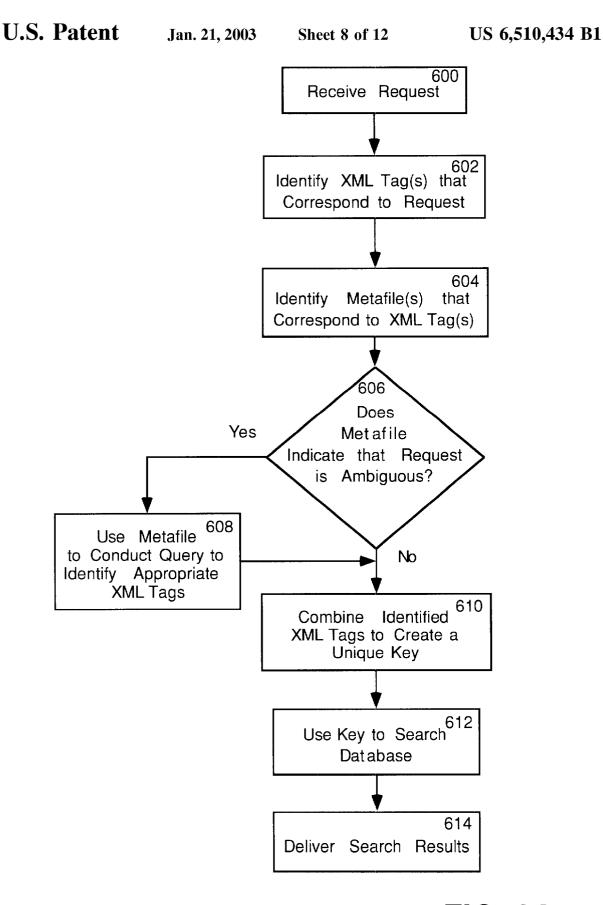


FIG. 6A

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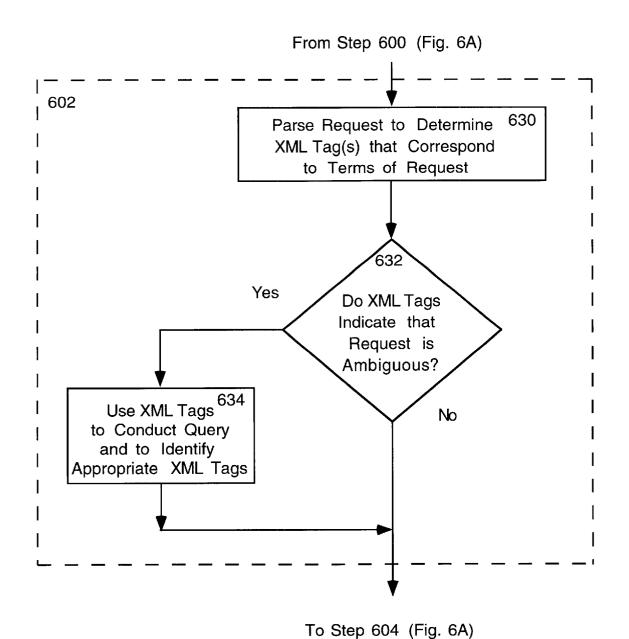
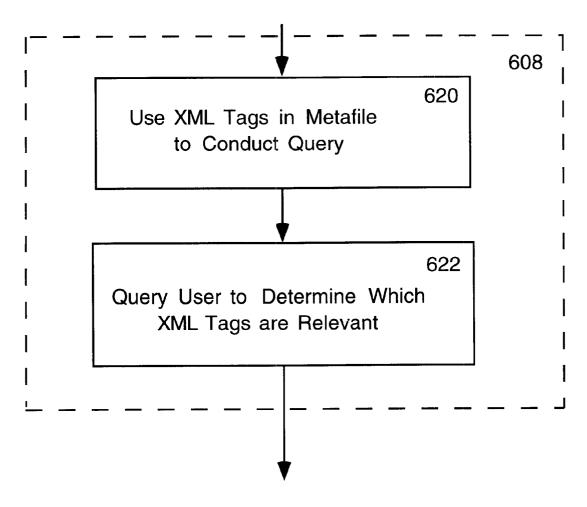


FIG. 6B

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From "Yes" Branch, Step 606 (Fig. 6A)



To Step 610 (Fig. 6A)

FIG. 6C

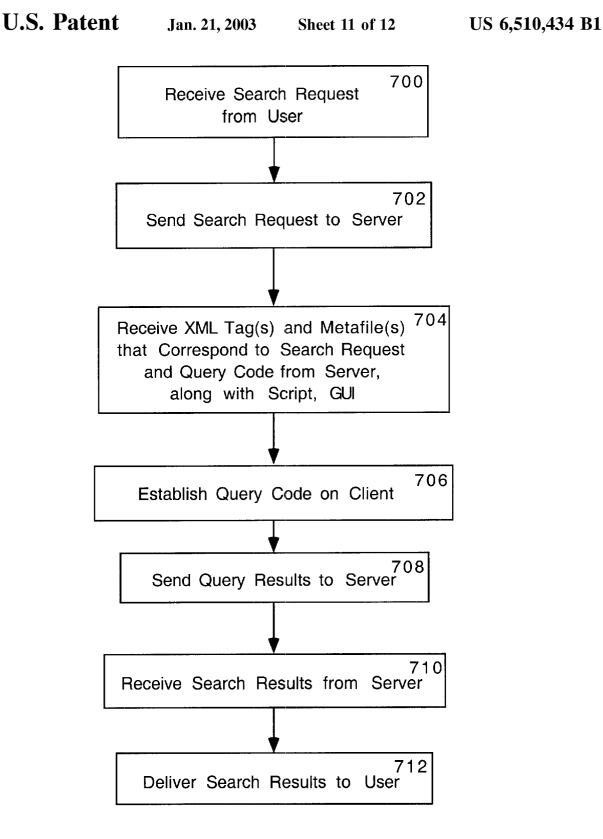
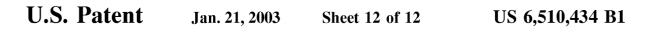


FIG. 7



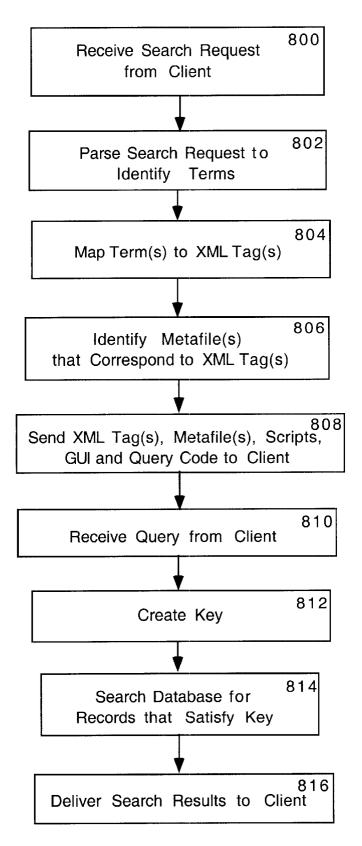


FIG. 8

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SYSTEM AND METHOD FOR RETRIEVING INFORMATION FROM A DATABASE USING AN INDEX OF XML TAGS AND METAFILES

RELATED APPLICATIONS

This U.S. patent application relates to U.S. Pat. No. 5,878,423, entitled "A System and Methods for Dynamically Processing an Index to Dynamically Create a Set of Questions", U.S. Pat. No. 5,937,168, entitled "A System and Methods for Routing Information Within an Adaptive Rout- 10 ing Architecture of an Information Retrieval System", U.S. Pat. No. 6,005,860 entitled "A Method for Routing Information Between an Origination Module and a Destination Module Using a Routing Architecture", and U.S. patent application Ser. No. 08/949,881, entitled "A System and 15 the database. Method for Processing a Memory Map to Provide Listing Information Representing Data within a Database" filed Oct. 14, 1997 now U.S. Pat. No. 5,952,946. The present application and the related U.S. patents and pending U.S. patent application are assigned to BellSouth Intellectual Property 20 multiple searches using different IR systems to locate all of Corporation.

TECHNICAL FIELD

This invention relates in general to locating information in a database, and more particularly to using an index that includes tags and metafiles to locate the desired information.

BACKGROUND OF THE INVENTION

There is an ever-increasing amount of recorded and 30 searchable information. To efficiently search for specific information, information retrieval systems have been developed. Information retrieval systems ("IR systems") are systems for finding, organizing, and delivering information. A computerized IR system typically responds to data inquiries or search requests by routing messages and files between a user interface and a search engine for a database in order to perform a search of the database for desired information.

A goal of an IR system is to locate the requested information as quickly as possible. However, one problem with 40 IR systems is that the search results returned do not always include the information requested. If the search results do not include the information requested, then the user must repeat the search using a different search request. One reason that the search results returned may not include the infor- 45 mation requested is that the IR system incorrectly interpreted the search request. This may happen if the search request uses an ambiguous term. The search request may be ambiguous because a term used in the search request has includes the term "Ford", it may be unclear whether the request is directed to the Ford Company, the Ford Theater, or the FORD brand of vehicles. Thus, there is a need in the art for a method that eliminates any ambiguity in the search

Another problem is that too much information can be returned to the user. If the user enters a broad search request, then the user may be overwhelmed by the amount of information returned and may not be able to locate the desired information in the search results. For example, if the search request specifies the FORD brand of vehicles, the search results returned may include information on every Ford vehicle, including automobiles, trucks, vans, and vehicles that are no longer in production, as well as information on the repair and sale of FORD brand vehicles. If the 65 between the tags in the metafile. user only wanted information about a particular model of automobile, the user must sort through the search results to

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locate the desired information. Thus, there is a need for a method that focuses a search so that only the most relevant information is returned or that queries a user for additional search criteria so that the information desired by the user is provided.

Due to the number of databases, it is possible that information stored in one database is repeated in another database. The same information may be stored in multiple databases to accommodate the requirements of different types of IR systems. To eliminate the need to maintain multiple databases that contain the same information, a universal search vocabulary is needed. If a universal search vocabulary is used to create a database, then any IR system that uses the universal vocabulary can locate information in

Even though there are a multitude of databases, the requested information may not be located in a single database. If a user requests information that is stored in separate, unrelated databases, then the user may need to conduct the desired information. To eliminate the need to conduct multiple searches, a universal search vocabulary is needed to search any number of separate, unrelated databases to locate the desired information.

Accordingly, there is a need in the art for an improved method of searching that uses a universal search vocabulary. The method should eliminate ambiguity in the search request, focus the search on the most relevant information, perform the search in the most efficient manner and support searching multiple databases. The method should also support a hierarchy that can be used to query a user for additional search criteria in an efficient and intelligent man-

SUMMARY OF THE INVENTION

The present invention meets the needs described above by providing a method for locating information stored in a database using an index that includes tags and metafiles to locate the desired information. In general, an index is essentially a guide that is used to locate information stored in a database. Preferably, the index includes tags that correspond to categories and domains. A category includes a group of terms. A term may appear in more than one category, but a term may only appear once in any given category. For example, the term "American" may appear in the Cuisine category and in the Brand category, but may only appear once in the Cuisine category.

A domain is generally described as a grouping of categories. For example, the Restaurant domain may include the multiple meanings. For example, if the search request 50 Cuisine category and, therefore, the terms "Mexican" and "American." The domains, categories, and terms are used to locate information within the database.

> The index is created so that a tag is associated with each domain (a domain tag) and with each term associated with 55 a category (a category tag). A tag is associated with data or text and conveys information about the data or text. In one aspect of the invention, the tags are XML (eXtensible Markup Language) tags. For example, an XML tag is created for the Restaurant domain and another XML tag is created for the American Cuisine category. In addition, many of the tags have an associated metafile. A metafile provides additional information about the tag. A metafile typically includes a list of related tags, such as domain tags and category tags. A metafile also implements a hierarchy

Each record of an exemplary database includes an Alpha Component and an XML Index Component. The Alpha

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Component contains identifying information for the record and the XML Index Component includes XML tags that are associated with the record. When a search request is received, a set of tags that correspond to the request are identified. The set of tags is compiled as a key and is used to search the database to locate records that include the set of tags.

A search is generally initiated by an information request. The information request can be received from a user or can be generated from an agent search. The information request is parsed to identify terms in the request. The terms are predetermined and correspond to the domains and categories of the index. The terms are mapped to XML tags. Once the terms are mapped to the XML tags, a determination is made as to whether the XML tags indicate that the request is ambiguous. The XML tags can indicate that the request is ambiguous if a single term in the request is related to more than one XML tag. If the XML tags indicate that the request is ambiguous, then the XML tags are used to conduct a query to determine the appropriate XML tags. The query may 20 include querying the user for additional information.

Once the appropriate XML tags are identified, then the metafiles that correspond to those XML tags are identified. Each metafile is examined to determine whether the XML tags in the metafile indicate that there are any related domains or categories. If there are a number of related XML tags in a metafile and the request does not clearly identify one of the related XML tags, then the metafile is used to supply information to a disambiguation process that identifies the tags that should be used to conduct the search. Once the query has been conducted to identify one of the XML tags, then that XML tag is combined with the other XML tags identified by the metafile and any other queries to create a unique key. The key is used to search the database to locate records that include the XML tags in their XML Index Component. Once the records are located, the records are delivered to the requesting user or search agent.

These and other aspects, features and advantages of the present invention may be more clearly understood and appreciated from a review of the following detailed description of the disclosed embodiments and by reference to the appended drawings and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a block diagram of a personal computer illustrating an exemplary operating environment for an embodiment of the present invention.

FIG. 1B is a block diagram illustrating the software components for an exemplary embodiment of the present 50 invention.

FIG. 2 is a block diagram illustrating the logical organization of information, in accordance with an embodiment of the present information.

FIGS. 3A and 3B are block diagrams illustrating the relationship between a tag and a metafile, in accordance with an embodiment of the present invention.

FIGS. 4A and 4B are block diagrams of an exemplary record in a database, in accordance with an embodiment of the present invention.

FIG. 5 is a flow chart illustrating the steps for creating a database and an index, in accordance with an embodiment of the present invention.

FIGS. 6A, 6B, and 6C are flow diagrams illustrating the 65 steps for searching a database, in accordance with an embodiment of the present invention.

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FIG. 7 is a flow diagram illustrating the steps performed by a client system to search a database, in accordance with an embodiment of the present invention.

FIG.~8 is a flow diagram illustrating the steps performed by a server system to search a database, in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The present invention is directed to a method for locating information stored in a database, and more particularly to using an index that includes tags and metafiles to locate the desired information. In general, an index is essentially a guide that is used to locate information stored in a database, such as a database of classified advertising information, consumer business information or information related to electronic commerce ("e-commerce"). As is further defined below, an exemplary index may include categories and domains, as well as terms. In one exemplary index, the index has one or more categories, such as the Cuisine category or the Brand category. A category is basically a group of terms. A term may appear in more than one category, but a term may only appear once in any given category. For example, the term "American" may appear in the Cuisine category and in the Brand category, but may only appear once in the Cuisine category.

The index also has one or more domains. A domain is generally described as a grouping of categories. For example, the Restaurant domain may include the Cuisine category and, therefore, the terms "Mexican" and "American." The domains, categories, and terms are used to locate information within the database.

In one embodiment, the index is created so that a tag, such as an XML (eXtensible Markup Language) tag, is associated with each domain (a domain tag) and with each term associated with a category (a category tag). For example, an XML tag is created for the Restaurant domain and an XML tag is created for the American Cuisine category. In addition, many of the tags have an associated metafile. A metafile includes a list of related tags, such as related domain tags, category tags and hierarchy tags. A hierarchy tag establishes a hierarchy within the tags of the metafile.

Each record of the database includes an index component which lists the domain tags and category tags that ate associated with that record. When a search request is received, a set of tags that correspond to the request are identified. The set of tags is compiled as a key and is used to search the database to locate records that include the set of tags in their index component.

Exemplary Operating Environment

FIGS. 1A and 1B and the following discussion are intended to provide a brief, general description of an exemplary computing operating environment in which the present invention may be implemented. Embodiments of the invention are described in the general context of software program modules that run on an operating system in conjunction with a computer. Generally, program modules include routines, programs, components, data structures, etc., that perform particular tasks or implement particular abstract data types. Moreover, those skilled in the art will appreciate that the invention may be practiced with other computer system configurations, including multiprocessor systems, other microprocessor-based or programmable electronic devices, minicomputers, mainframe computers, and the like. Those skilled in the art will appreciate that FIGS. 1A and 1B and the associated discussion are intended to provide a brief,

general description of exemplary computer hardware and program modules, and that additional information is readily

available in the appropriate programming manuals, users guides, and similar publications.

Referring now to FIG. 1A, an exemplary computer system 5 for implementing the present invention includes a conventional computer 20, including a processor 21, a system memory 22, and a system bus 23 that couples the system memory 22 to the processor 21. Although not shown in FIG. present invention may include additional processors, each of which are coupled to the system memory 22. In this alternative configuration, the additional processors are deemed to be adjunct processors capable of being dedicated to particular software processes concurrently executing within the 15 computer 20.

The system memory 22 includes random access memory ("RAM") 25. The computer 20 further includes a hard disk drive 27 and an optical disk drive 30 (e.g., a disk drive that reads from a CD-ROM disk 31 or reads from or writes to 20 other optical media). The hard disk drive 27 and the optical disk drive 30 are connected to the system bus 23. The drives and their associated computer-readable media provide nonvolatile storage for the computer 20. Although the description of computer-readable media above includes the hard 25 disk drive 27 and the optical disk 31, such as a CD, it should be appreciated by those skilled in the art that other types of media, which are readable by a computer, may also be used in each of the exemplary operating environments described with regard to FIG. 1A.

A number of program modules may be stored in the drives 27, computer-readable 31, and RAM 25, including an operating system 32 and a variety of other software program modules. In an embodiment of the present invention, an example of such software modules is a group of software 35 modules collectively referred to as interactive information retrieval system modules 26 (IR system modules). The IR system modules 26 preferably include the following software modules:

one or more front end modules 33,

one or more delivery modules 34,

a middleware layer of software 35 for routing information and requests between the IR system modules 26,

an index 37,

relationship tables 38, and

a search engine module 39 for searching a database 40 stored on the hard disk drive 27 or on the optical disk 31 in the optical disk drive 30.

The operating system 32 provides the basic interface 50 between the computer's hardware and software resources, the user, and the IR system modules 26. In the exemplary operating environments described with regard to FIG. 1A, the operating system 32 is preferably a real-time operating system. A real-time operating system is desired in order to provide adequate response when searching and interacting with multiple users. Those skilled in the art will appreciate the need for real-time, multithreaded performance in information retrieval applications in order to support an adequate level of transactional performance.

As with most conventional computer systems, a user may enter commands and information into the computer 20 through a keyboard (not shown) and an input or pointing device, such as a mouse (not shown). These and other input devices are often connected to the processor 21 through a serial port interface (not shown) connected to the system bus 23. A monitor (not shown) or other type of display device

can also be connected to the system bus 23. In addition to the monitor, computers such as the computer 20 typically include other peripheral output devices (not shown), such as printers and backup devices.

In the exemplary embodiment, a user typically interacts with the computer 20 when the computer 20 functions in a server capacity. In this capacity, the computer 20 can service a remote programmable device (such as a remote computer 41), or a telecommunications device (such as a conventional 1A, the exemplary computer system for implementing the 10 telephone 42) via a voice recognition interface, each of which is logically connected to the computer 20.

The remote computer 41 may be a server, a router, a peer device, or other common network node. Typically, the remote computer 41 includes many or all of the elements described relative to the standalone computer **20**. The logical connection between the remote computer 41 and the computer 20 depicted in FIG. 1A is a data communications network, such as a wide area network ("WAN") 43. Other examples of data communications networks include enterprise-wide computer networks, intranets, or the global Internet. A communications interface, such as a network communications interface 44 in the computer 20, links the WAN 43 and the computer 20. However, the logical connections to the computer 20 may also be a local area network ("LAN") (not shown) that is commonplace in offices. Typically, a user of the remote computer 41 interacts with the computer 20 via such logical connections in order to search the database 40 for information.

A telephony communication interface 45 (also known as a telephony line card) connected to a conventional public switched telephone network 46 ("PSTN") provides the logical connection between the computer 20 and the conventional telephone 42. In this manner, the user can interact with the computer 20 with voice responses via a conventional telephone 42 or other telephonic device. In the preferred embodiment, the telephony communication interface 45 is a Model D/160SC-LS telephone line interface card having an Antares 2000/50 digital signal processing ("DSP") card, both of which are manufactured by Dialogic Corporation of 40 Parsippany, N.J. Both the network communications interface 44 and the telephony communication interface 45 are generally referred to as "communication interfaces" because the computer 20 provides the service of processing data inquiries through both of these interfaces. It will be appreciated 45 that the network and telephone connections shown are exemplary and other means of establishing a communications link between the computer 20 and the remote computer 41 or conventional telephone 42 may be used.

From this brief description, it should be appreciated that operating systems and networking architectures are quite complex and provide a wide variety of services that allow users and programs to utilize the resources available in the computer or in other computers in a distributed computing environment. Those skilled in the art will be familiar with operating systems, networking architectures and their various features. Likewise, those skilled in the art will appreciate that the IR system modules 26 provide a wide variety of features and functions in addition to those included in the brief description presented above.

Software Modules of the IR System

The software modules of the IR system 26 are shown in FIG. 1B. The software modules are used to process a search request and search the database 40. The front end modules 33 receive the user's search request. The search request is processed using the index 37, the relationship tables 38, and the search engine 39. Once the records satisfying the search request are located, the records are delivered to the user via

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one of the delivery modules 34. The middleware routing architecture 35 connects the front end modules 33 and the delivery modules 34 to the index 37, the relationship tables 38, and the search engine module 39.

The user makes a search request or an information request by communicating with the computer 20 via ,the conventional telephone 42 or via the remote computer 41. The user's search request is handled by one of the front end modules 33. If the user'communicates via the PSTN 46, the module receiving the information may be an interactive voice response ("IVR") module 105 and the recognizer module 110. If the communication path is via the WAN 43, the module receiving the information may be the data front end module 115. The delivery modules 34 are used to return the information located by the search to the user. The information can be transmitted via a text-to-speech ("TTS") module 120, via a facsimile module 125 or via a remote computer 41 using a GUI interface.

The index 37 is essentially a guide to the records of the database 40. The index includes a number of tags and metafiles associated with the tags. A tag is generally associated with data or text and conveys information about the data or text. A metafile is associated with a tag and provides additional information about the data or text described by the tag. A metafile includes tags to create an association with the tag or to imbed intelligence into the search process. A metafile can also include other types of data, such as data describing the type of association. In the exemplary embodiment discussed herein, the index uses XML (eXtensible Markup Language) tags and XML metafiles that include additional XML tags. The relationship tables 38 define the relationships between the XML tags of the index and the applications.

The index 37 includes domain tags, category tags, and hierarchy tags. In the exemplary embodiment discussed herein, the tags follow the organization of a classified advertising directory or an e-commerce based system. Categories are basically groups of terms. A term can be associated with more than one category, but a single term cannot be repeated within a category. For example, the term "American" can be associated with the Cuisine category, as, well as the Brand category. The category tags typically describe information that is common to a number of business, such as hours of operation, type of payment accepted, years in business at the same location, etc. However, as will be apparent to those skilled in the art, alternative organizations are also possible.

Sample categories and terms are shown below in Table 1.

TABLE 1

Terms	Type of Category
FORD	Brand
NIKE	Brand
Chinese	Cuisine
AMERICAN EXPRESS	Payment Option
Valet Parking	Amenity

The index also comprises domains, such as Restaurant and Automobile. In an exemplary embodiment, a domain can correspond to a line of business listing in a classified advertising directory. A domain, such as the Restaurant 60 domain, is essentially a grouping of categories and the respective associated terms. For example, the Restaurant domain is associated with categories, such as Cuisine, Operating Hours, and Amenities, and the respective associated terms, such as Mexican, Chinese, and American (for 65 Cuisine). Each domain can have categories that are associated with other domains.

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The hierarchy tags establish a hierarchy between the tags in the metafile. The hierarchy is used to guide a user through the process of searching the database. Typically, a default hierarchy is established for each domain. For example, in the Sestaurant domain, the Cuisine category tags have priority over the Geography category tags and the Geography category tags have priority over the Amenities category tags. Although the hierarchy tags implement a default priority, a user can override the default priority to search for information using a different priority. Thus, a user could search for information about a restaurant that is located nearby regardless of the type of cuisine served.

An alternative organization to the organization of a classified advertising directory or an e-commerce based system could be based on trade names or brands. In a typical classified advertising directory or e-commerce based system, each business entity is listed by domain and category. In a trade name or brand organization, the business entities that are related to a particular trade name or brand are listed together. Consider the HONDA brand of automobiles, lawnmowers and motorcycles. In a classified advertising directory or e-commerce based system a seller of HONDA automobiles would be listed in a separate domain (automobile) than a seller of HONDA lawn mowers (lawn mower). However, in a trade name or a brand directory, all dealers, service providers and parts providers would. be listed together in a single location under the HONDA brand.

As shown in FIG. 2, the various products, such as product One **202** and Product Two **204**, are collected under the Trade Name/Brand listing 200. In the HONDA example, Product One may correspond to automobile and Product Two may correspond to lawn mower, and a third product, Product Three (not shown) may correspond to motorcycle. Underneath each product are additional classifications, such as Authorized Dealer 210, Authorized Service Provider 212 and Authorized Parts Provider 214. Under the Authorized Dealer classification 210 are listings for individual authorized dealers 220, 222, 224. Under the Authorized Service Provider classification 212 are listings for authorized service providers 220, 226, 228. Under the Authorized Parts Provider classification 214 are listings for authorized parts providers 220, 226, 230. The listings under the Authorized Dealer classification 210 may overlap with the listings under the Authorized Service Provider classification 212 and/or the 45 Authorized Parts Provider classification 214. For example, Listing One 220 appears under the Authorized Dealer classification 210, as well as the Authorized Service Provider classification 212 and the Authorized Parts Provider classification 214.

In one embodiment, an organization based on trade names or brands can be implemented by associating an XML tag with each trade name/brand, product, and classification. The XML tag that is associated with the trade name/brand has an associated metafile that includes the tags for the related products and classifications. The metafile can also establish a hierarchy by prioritizing the product tags and classification tags of the metafile.

As will be apparent to those skilled in the art, other classifications can also be used with trade names or brands. For example, if the trade name corresponds to a trade name for a sporting goods manufacturer, then the classifications underneath the trade name/brand could correspond to different sports, such as golf, tennis, baseball. XML and Metafiles

In the exemplary embodiment discussed herein, the index includes a set of eXtensible Markup Language (XML) tags and metafiles. XML is a syntax for creating a markup

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language that uses a set of tags. XML is a subset of the Standard Generalized Markup Language (SGML). The XML standard is maintained by the World Wide Web Consortium (W³C).

XML can be used to create a markup language that 5 includes tags that specify the meaning of a piece of information and the relationship of the information to other information, rather than just describing how that piece of information should be displayed or printed. For example, an XML tag can describe a piece of information as information 10 database record 400 includes an Alpha Component 402 and about an author rather than just describing that the piece of information is to be displayed in italics. XML supports the description of information in a hierarchical, structured manner. XML can be used to create a universal search vocabulary using a common set of XML tags so that an IR system 15 can access information located in any database that uses the common set of XML tags.

An XML metafile provides additional information about the information identified by the XML tag. Each XML tag can have an associated metafile. In the exemplary embodiment discussed herein, a metafile includes one or more XML tags. Although each XML tag can have an associated metafile, in some implementations there may be XML tags that do not have associated metafiles. The XML tags define the XML tag.

FIG. 3A shows an XML tag (<XML Tag>) 300 and its associated metafile 302. The metafile includes <XML Tag.,> **304**, <XML Tag_b> **306**, <XML Tag_c> **308**, through <XML $Tag_n > 310$. A single XML tag, such as $< XML Tag_a > 304$, 30 may appear in a number of metafiles. The number and type of XML tags that are included in the metafile will be determined by the specific XML tag 300.

FIG. 3B shows <XML Tag> 320 and its associated metafile 322. The metafile 322 includes a number of tags, 35 <XML Tag_a> 324, <XML Tag_b> 328 through <XML Tag_n>340, as well as <Relationship Information> 326. The relationship information is associated with a particular XML tags and provides information about the relationship between two XML tags, such as <XML Tag> 320 and <XML Tag_a> 324. Although not shown in FIG. 3B relationship information can be associated with other XML tags in the metafile. The XML tags can be used to establish a hierarchy so that $\langle XML \operatorname{Tag}_a \rangle$ 324 has priority over $\langle XML \operatorname{Tag}_b \rangle$ <XML Tag_a> 324, has priority over <XML Tag_a> 334, \times XML Tag, \Rightarrow 336, \times XML Tag, \Rightarrow 338 . . . \times XML Tag, \Rightarrow 340.
In one embodiment, \times XML Tag, \Rightarrow 320 corresponds to a Restaurant domain tag and <XML Tags_{e-n}> correspond to category tags, such as Cuisine, Geography, Price and Ameni- 50 ties. In addition, <XML Tag_a> corresponds to a related domain and the relationship information provides further information about the relationship between the Restaurant domain and the related domain. The hierarchy of the XML tags in the metafile can be used by an application to 55 prioritize the search criteria. As will be apparent to those skilled in the art, other tags and hierarchies can be included in the metafile.

The XML tags shown in FIGS. 3A and 3B and used herein are only descriptive in nature. The actual XML tags used conform to the XML syntax and standards, as established by the appropriate standards bodies (e.g. the World Wide Web Consortium).

An Exemplary Database Record

The present invention provides a method for searching a 65 database comprising a number of records. Each record contains specific information. An example of such informa10

tion using the organization of a classified advertising directory or an e-commerce based system is information about a restaurant describing the type of cuisine served, location, hours of operation, payment methods accepted, and amenities offered. Another example is information about an automobile sales center describing the brand of automobile it sells, the models it sells, and its hours of operation. In the exemplary embodiment, each record is an XML document.

FIG. 4A illustrates an exemplary database record 400. The an XML Index Component 404. The Alpha Component 402 contains identifying information for the record and the XML Index Component 404 includes XML tags that are associated with the record.

An example of a database record for a restaurant is shown in FIG. 4B. The record 406 shown in FIG. 4B includes an Alpha Component 408 and an XML Index Component 410. In this example, the identifying information contained in the Alpha Component includes a business name (Terrace Restaurant), as well as an address (125 Poplar Street, Atlanta, Ga. 30303) and telephone number (404/828-4373). The XML Index Component 410 includes a number of domain tags and category tags.

The domain tags shown in FIG. 4B include the Restaurant included in the metafile identify related XML tags or further 25 domain tag (<Restaurant_Tag>) 412 and the Catering domain tag (<Catering_Tag>) 414. The category tags include the Downtown Geography category tag (<Downtown_Geography_Tag>) 416, the American Cuisine category tag (<American_Cuisine_Tag>) 418, the Valet Parking Amenity category tag (<Valet_Parking_ Amenity_Tag>) 420, the AMERICAN EXPRESS Payment Option category tag (<AMERICAN_EXPRESS_ Payment_Tag>) 422, the VISA Payment Option category tag (<VISA_Payment_Tag>) 424, and the MASTER-CARD Payment Option category tag (<MASTERCARD_ Payment Tag>) 426. The Restaurant domain tag 412 identifies the Terrace Restaurant as a restaurant. The Catering domain tag 414 indicates that the Terrace Restaurant provides catering services. The Downtown Geography category tag 416 indicates that the Terrace Restaurant is located downtown. The American Cuisine category tag 418 indicates that the Terrace Restaurant serves American cuisine. The Valet Parking Amenity category tag 420 indicates that the Terrace Restaurant provides valet parking. The AMERI-328, <XML Tag_c> 330 . . . <XML Tag_d> 332. In addition, 45 CAN EXPRESS Payment Option category tag 422 indicates that the Terrace Restaurant accepts AMERICAN EXPRESS charge cards, the VISA Payment Option category tag 424 indicates that the Terrace Restaurant accepts VISA credit cards and the MASTERCARD Payment Option category tag **426** indicates that the Terrace Restaurant accepts MASTER-CARD credit cards.

> In an exemplary embodiment, a number of records similar to the record shown in FIG. 4B are stored within the database. Each record has identifying information in its Alpha Component that is similar to that shown in FIG. 4B. Additional identifying information could also be included in the Alpha Component, such as a facsimile number or an Internet address. The number and type of tags included in the XML Index Component is determined by the particular record. For a record corresponding to another restaurant, the number and the types of tags may differ. For example, if the other restaurant does not provide catering services, then the catering domain tag will not appear in the XML Index Component for that record.

> For records corresponding to entities other than restaurants, different types of tags can be used, as will be apparent to those skilled in the art. For example, a record

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that corresponds to an automobile sales center may include tags that correspond to the brand of automobiles leased or sold (Brand category), automobile repair (Repair category), and automobile parts (Parts category).

Creating an Index Using XML Tags and Metafiles

FIG. 5 illustrates the steps for creating an index, including XML tags and metafiles, that can be used to search a database. In step 500, the index is defined by defining the XML tags for the index. The XML tags include domain tags and category tags. An advantage of using XML tags is that 10 the steps typically performed by a user to locate information. XML is a platform independent-language that can be run on a number of systems. XML can be used to create a universal search vocabulary that can be used to search information stored in a variety of databases. The index can be used to create a vocabulary that can expand traditional information 15 categories. For example, in addition to creating tags for cities and other municipalities, tags can also be created that identify communities, such as the Buckhead Community in Atlanta, or a landmark, such as Turner Field.

In step 502, the relationship between the request terms 20 information about related domains. and the XML tags defined in step 500 are defined. The request terms are the terms that can be recognized from an initial request for information. In some instances, the request terms may be very similar to the XML tags. For example, the term "restaurant" in a request is mapped to the Restaurant domain tag. In other instances, the relationship between a request term and an XML tag can be defined to provide an additional function, such as identifying the term "coffee shop" as a synonym for restaurant. The relationship between a request term and an XML tag can also be used to recognize 30 local idioms. For example, if a certain street is known locally as "old US 1", then a relationship can be defined that maps the term "old US 1" to 4th Street. În addition, the relationship between a request term and an XML tag can be defined to include misspellings. For example, the term "resterent" can 35 Method for Searching a Database be defined as a misspelling of restaurant. The relationship between a request term and an XML tag can also be used to provide language translation. For example, if the request for information includes the term "trattoria" (an Italian word for restaurant), then the term trattoria could also be mapped to 40 the Restaurant domain tag. In one embodiment, separate translation files are used to implement synonym, local idiom, misspelling and language translation to optimize the search of the database.

and category tags that were defined in step 500. A metafile includes one or more XML tags that are related to the selected XML tag. For example, the Restaurant domain tag may have an associated metafile that includes XML tags that file for a particular XML tag can be created manually by using data gathered from observation. For example, a metafile can be created by observing the types of information that a user typically considers when selecting a restaurant. If a user typically considers the type of cuisine served, the 55 payment methods accepted, and the amenities offered when selecting a restaurant, then XML tags for these types of information are included in the metafile that corresponds to the Restaurant domain tag. By including tags that are associated with the type of information that a user typically considers when choosing a restaurant in the metafile, the search method can focus efficiently on records that satisfy the user's search request.

In addition, a hierarchy between the tags in the metafile can be created in Step 504. The hierarchy is use d to query 65 the user for additional search criteria to focus the search on the most relevant information. For example, if a user

requests information about restaurants, the user is queried for additional search terms related to cuisine and geography so that the user is not overwhelmed with information about restaurants. One method for creating an ordered set of questions that can be used to prompt a user for additional search criteria is described in U.S. Pat. No. 5,878,423, entitled "Dynamically Processing an Index to Create an Ordered Set of Questions."

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The tags included in a metafile may also be influenced by Consider a user that is trying to locate information about catering services. The user might formulate a request that includes the term "catering." Alternatively, the user might formulate a request that uses the term "restaurant" rather than catering. If the metafile for the Restaurant domain tag includes the Catering domain tag, then the user can clarify if the user wants information on restaurants or catering. By including related tags in the metafile, the search method can eliminate ambiguity in the search request and can provide

In a commerce environment, the tags included in a metafile may also be used to cross-sell or cross-market items. For example, a metafile corresponding to the Catering domain tag, may include a Florist domain tag, a Balloon domain tag, and a Musician domain tag. If the user is trying to locate information about catering, it is possible that the user is planning a party. By including tags for the Florist domain, the Balloon domain, and the Musician domain, the metafile can be used to present the user with the option of locating information about related products and services that the user may desire.

Finally, in step **506**, the individual records for the database are created. The records include one or more domain tags and category tags, as discussed in more detail above.

FIGS. 6A–C illustrate exemplary steps for locating information in a database using an index including XML tags and metafiles. In step 600, an information request is received. Typically the information request is received from a user. The user can enter the request using a computer by typing the information on the keyboard, by selecting search terms from a menu, or by entering voice commands. Alternatively, the user can enter the request via a telephone. In addition, the request could come from an agent search that was initiated In step 504, metafiles are created for selected domain tags 45 on a network, such as the Internet. The information request can come in a variety of formats. For example, if the user enters the information request using a computer, the request may be entered by completing a number of fields on a form or the request could be entered by speaking or typing a define other related domain tags and category tags. A meta- 50 natural language request. An example of a natural language request would be "locate a Mexican restaurant in Buckhead."

> In step 602, the XML tags that correspond to the request are identified. The details of step 602 are shown in FIG. 6B and are discussed in more detail below. Once the XML tags that correspond to the request have been identified, then in step 604, the metafiles that correspond to the identified XML tags are identified.

In step 606, a determination is made as to whether the 60 request is ambiguous. Step 606 examines the metafile identified in step 604 to determine whether the metafile indicates that the request is ambiguous. The request may be ambiguous if the metafile indicates that there are a number of related domains and the request does not clearly indicate one of the domains. For example, if the request includes the term "barbecue" and a metafile that is associated with the Barbecue Cuisine tag identifies the domains for restaurant,

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restaurant supplies and barbecue equipment, then it is unclear from the single term barbecue whether the request is directed towards a restaurant serving barbecue cuisine, a barbecue catering service, or barbecue equipment.

In this example, the metafile identifies three related domains, the Restaurant Domain, the Catering Domain and the Barbecue Equipment Domain. If there are no additional terms in the request that help clarify the request, the metafile indicates that the request is ambiguous, and the "Yes" branch conduct a query to identify one of the related XML tags. Additional details of step 608 are shown in FIG. 6C and are discussed in further detail below. Once the query has been conducted to identify the appropriate XML tags, then the method proceeds to step 610. Alternatively, if the metafile did not indicate that the request was ambiguous, then the "No" branch is followed from step 606 to step 610. In step 610, the XML tags are combined to create a key. The XML tags combined in step 610 may be the tags identified in step 602 and/or the XML tags identified in step 608. In step 612 20 the key is used to search the database to locate records that include the XML tags. Finally, in step 614 the records that were identified in step 612 are delivered as search results to the user or agent.

FIG. 6B provides additional details of the step of identi- 25 fying XML tags that correspond to the request received in step 602. As shown in FIG. 6B, once the request is received in step 600, the request is parsed in step 630 to identify terms. As discussed above, the terms are predefined. For example, typical terms for a database that includes classified 30 advertising or e-commerce information may include automobile, restaurant, physician, etc. Once a term is identified in step 630, the XML tag associated with the term is identified.

In step 632, a determination is made as to whether the 35 XML tags identified in step 630 indicate that the request is ambiguous. The XML tags identified in step 630 can indicate that the request is ambiguous if a single term in the request is related to more than one XML tag. For example, if the term "American" is part of the request, then the term "American" is related to the American Cuisine tag, as well as the American Brand tag. If the remaining terms of the request do not clarify which of these category tags correspond to the request, then the determination in step 632 is that the request is ambiguous. However, depending upon the 45 power of the parser, the request may include other terms or text that clarify which category tag is appropriate. For example, if the request indicates that the user wishes to locate an American restaurant, then the American Cuisine tag is the appropriate XML tag.

If the XML tags identified in step 630 do not indicate that the request is ambiguous, then metafiles for the identified XML tags are located in step 604. However, if the XML tags identified in step 630 indicate that the request is ambiguous, then the "Yes" branch is followed to step 634 and the 55 identified XML tags are used to conduct a query to determine the appropriate XML tag. In the example using the term "American," the query could request that the user choose between cuisine or brand. Once the appropriate XML tag is identified, then the method proceeds to identify the 60 metafiles in step 604.

FIG. 6C illustrates additional details of step 608. In step 608, the metafile is used to conduct a query to identify the XML tags of the metafile that are appropriate to the request. In step 620, the XML tags in the metafile are used to conduct 65 the query. For example, if the metafile includes the domain tags for restaurant, catering, and barbecue equipment, then

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the Restaurant Domain tag, the Catering Domain tag and the Barbecue Equipment Domain tag are used to conduct a query to identify the appropriate domain tag. In this example, the query may ask whether the user is looking for a barbecue restaurant, barbecue catering or barbecue equipment. This query occurs in step 622. Once the query is complete, one of the related domain tags is identified and the others are eliminated. Continuing from step 622, the identified XML tag are used to create the unique key in step 610, is followed to step 608. In step 608, the metafile is used to 10 whereas the eliminated XML tags are not used to create the

Client-Server

The present invention is particularly well suited to a client-server environment. The database or databases can 15 reside on a network, such as the Internet, and can be accessed through the server system. A user can initiate a request for information using a client system, such as a personal computer running an Internet browser. As discussed above in connection with FIGS. 6A-6C, it may be necessary to conduct a query with the user to help focus the search. If a query must be conducted with the user, then it is desirable that the query be run as quickly as possible so that the user does not have to wait while the server is accessed. In the client-server environment, the queries to identify the appropriate XML tags are established on the client and the database search is executed on the server. By establishing the query on the client rather than the server, the speed of the query is increased because the query does not require as many communications with the server. FIG. 7 illustrates exemplary steps performed by the client and FIG. 8 illustrates the steps performed by the server to search a database using an embodiment of the present invention.

The client receives a search request from the user in step 700. As discussed above, the search request can be in the form of text input via a computer or voice input via a computer or telephone. Once the client receives the search request from the user, the client sends the search request to the server in step 702. The client then receives XML tags and metafiles that correspond to the search request, as well as query code from the server in step 704. In one embodiment, the query code is written in the JAVA programming language and prompts the user for additional information via pop-up windows. The query code uses the XML tags and the metafiles received from the server to formulate the necessary queries to the user. The query code is executed on the client in step 706. Once the query code is executed, the query results are sent to the server in step 708. The query results include XML tags identified during the query, as well as XML tags previously received from the server. The server then executes a search of the database. The search results are received from the server in step 710 and the search results are delivered to the user in step 712.

FIG. 8 illustrates the steps performed by the server in a client-server environment. In step 800, the search request is received from the client. The search request is then parsed to identify the terms of the search request in step 802. The terms of the search request are then mapped to XML tags in step 804. Once the XML tags are identified in step 804, then the metafiles that correspond to the XML tags identified in step 804 are identified in step 806. The XML tags and the metafiles are then sent to the client. In addition, the server also sends query code to the client. The query code instructs the client to query the user to further refine the identified XML tags. Once the client has completed the query, the query results are received from the client in step 810. The query results include one or more XML tags. The XML tags are combined to create a key in step 812. The key is then

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used to search the database for records that include the XML tags in the key in step 814. Finally, the search results are delivered to the client in step 816.

Conclusion

In summary, the present invention is directed toward a 5 method for locating information stored in a database using an index that includes tags and metafiles. Preferably, the index includes tags that correspond to categories and domains. An information request is parsed to identify the terms in the request. The terms are predetermined and generally correspond to the domains and categories of the index. The terms are mapped to tags. Once the appropriate tags are identified, then the metafiles that correspond to those tags are identified. The metafiles can be used to identify additional tags that are relevant to the search. The identified tags are combined to create a unique key. The key $\,^{15}$ is used to search the database to locate records that include the tags in their index component. Once the records are located, the records are delivered to the requesting user or search agent. Although the present invention has been described in connection with the XML language, those 20 skilled in the art will realize that the invention can also be practiced using other languages that use tags and support the association of a file, such as a metafile with a tag.

The present invention has been described in connection with information organized as a classified advertising or e-commerce directory. However, those skilled in the art will recognize that the invention is not limited to information organized as a classified advertising or e-commerce directory. For example, the invention can be used with information organized around a trade name or brand, or any other 30 type of organization.

Alternative embodiments will be apparent to those skilled in the art to which the present invention pertains without departing from its spirit and scope. Accordingly, the scope of the present invention is described by the appended claims 35 and is supported by the foregoing description.

What is claimed is:

1. A method for creating a database and an index to search the database, comprising the steps of:

creating the index by defining a plurality of XML tags including domain tags and category tags;

creating a first metafile that corresponds to a first domain tag; and

creating the database by providing a plurality of records,

45 includes a fourth tag, further comprising the steps of:

2. The method of claim 1, wherein the step of creating the database by providing a plurality of records, comprises the

for each record, creating an alpha portion of the record 50 that comprises identifying information for the record;

for each record, creating the XML index component by selecting from the defined XML tags a selected set of XML tags that are associated with the record.

3. The method of claim 1, wherein the step of creating a first metafile, comprises the steps of:

selecting a first set of domain tags from the defined XML tags that are related to the first domain tag; and

selecting a first set of category tags from the defined XML 60 tags that are related to the first domain tag.

4. The method of claim 3, wherein the first domain tag is related to a first product and the first set of domain tags includes a selected domain tag that identifies a second product related to the first product so that the second product 65 prising the steps of: is marketed to a user when information related to the first product is provided to the user.

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- 5. The method of claim 3, further comprising the step of: creating a hierarchy between the tags in the metafile.
- 6. The method of claim 1, wherein the step of creating a first metafile comprises the steps of:

selecting a first set of XML tags from the defined XML tags that are related to the first domain tag; and

creating a hierarchy between the tags in the first set of XML tags.

7. A method for searching a database of records using an index including a plurality of tags, comprising the steps of: receiving a request for information;

identifying a first tag that is associated with the request; determining whether a first metafile comprising a second tag corresponds to the first tag;

if the first metafile corresponds to the first tag, then determining whether the second tag is relevant to the

if the second tag is relevant to the request, then combining the first tag and the second tag to create a key; and

using the key to search the database to locate at least one record that includes the first tag and the second tag.

8. The method of claim 7, wherein the step of identifying a first tag that is associated with the request, comprises the steps of:

parsing the request to identify a first term; and

identifying the first tag that corresponds to the first term.

9. The method of claim 8, further comprising the steps of: identifying a third tag that corresponds to the first term; determining whether the first tag and the third tag indicate that the request is ambiguous;

if the first tag and the third tag indicate that the request is ambiguous, then determining whether the first tag is related to the request; and

if the first tag is related to the request, then using only the first tag to create the key.

10. The method of claim 9, further comprising the steps

if the first tag and the third tag do not indicate that the request is ambiguous, then using the first tag and the third tag to create the key.

11. The method of claim 7, wherein the first metafile

determining whether the second tag and the fourth tag indicate that the request is ambiguous;

if the second tag and the fourth tag indicate that the request is ambiguous, then determining whether the second tag is related to the request; and

if the second tag is related to the request, then using only the second tag to create the key.

- 12. The method of claim 7, wherein the plurality of tags $_{55}\,$ include a plurality of category tags and a plurality of domain tags, each category tag associated with a term that provides information and each domain tag associated with a group of category tags.
 - 13. The method of claim 12, wherein the category tags include a brand tag, a cuisine tag, a payment option tag, and
 - 14. A computer-readable medium having stored thereon computer-executable instructions for searching a database of records using an index including a plurality of tags, com-

receiving a request for information;

identifying a first tag that is associated with the request;

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- identifying a second tag that is associated with the request by determining that the second tag is included in a metafile associated with the first tag;
- combining the first tag and the second tag to create a key; and
- using the key to search the database to locate records including the first tag and the second tag.
- 15. The computer-readable medium of claim 14, further comprising the steps of:
 - determining whether the first tag and the second tag indicate that the request is ambiguous;
 - if the first tag and the second tag indicate that the request is ambiguous, then conducting a query to determine whether the first tag or the second tag is relevant to the 15 request;
 - if the determination is that the first tag is relevant to the request, then using the first tag, but not the second tag to create the key; and
 - using the key to search the database to locate records ²⁰ including the first tag, but not the second tag.
- 16. The computer-readable medium of claim 14, wherein the request includes a first term, and wherein the step of identifying a first tag that is associated with the request, comprises:

identifying the first term in the request; and matching the first term to the first tag.

- 17. The computer-readable medium of claim 14, wherein the metafile includes a third tag, further comprising the steps of:
 - if the first tag and the second tag do not indicate that the request is ambiguous, then combining the first tag, the second tag, and the third tag to create a key; and
 - using the key to search the database to locate records $_{35}$ including the first tag, the second tag, and the third tag.
- 18. The computer-readable medium of claim 14, wherein the plurality of tags include a plurality of domain tags and a plurality of category tags, and wherein each domain tag identifies a group of selected category tags and each category tag identifies a group of terms providing business information.
- 19. A method for searching a database of information, comprising the steps of:
 - receiving a request for information from a client, the 45 request having a first term;
 - identifying a first XML tag that is associated with the first term;
 - determining whether a first metafile corresponds to the first XML tag;
 - if the first metafile corresponds to the first XML tag, then transmitting the first XML tag, the first metafile and query code to the client;
 - once the client conducts a query by executing the query code using the first XML tag and the first metafile, then receiving query results including a first set of XML tags from the client:
 - combining the first set of XML tags into a key;
 - using the key to search the database to locate records 60 including the first set of XML tags; and
 - delivering the records including the first set of XML tags to the client.
- 20. The method of claim 19, wherein the first set of XML tags includes a domain tag and a category tag.
- 21. The method of claim 19, wherein each of the records includes an XML index component that includes at least one

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- XML tag, and wherein the step of using the key to search the database to locate records including the first set of XML tags comprises:
- searching the database to locate a record with an XML index component that include the first set of XML tags.
- 22. A method for identifying a record from a database of records that satisfies a request for information, comprising the steps of:
 - receiving the request for information;
 - sending the request to a server;
 - receiving a first XML tag and a first metafile that are associated with the request and query code from the server;
 - executing the query code to determine a first set of XML tags that are associated with the request;
 - sending the first set of XML tags to the server;
 - receiving the record from the server; and
 - delivering the record.
- 23. The method of claim 22, wherein the first metafile includes a second XML tag, and wherein the step of executing the query code to determine a first set of XML tags that are associated with the request, comprises the steps of:
 - determining whether the second XML tag is associated with the request; and
 - if the second XML tag is associated with the request, then including the second XML tag in the first set of XML tags.
- 24. The method of claim 22, wherein a third XML tag and a fourth XML tag are received from the server, and wherein the step of executing the query code to determine a first set of XML tags that are associated with the request, comprises the steps of:
- if the third XML tag and the fourth XML tag indicate that the request is ambiguous, then determining whether the third XML tag is related to the request; and
- if the third XML tag is related to the request, then including the third XML tag, but not the fourth XML tag in the first set of XML tags.
- 25. A method for creating a metafile that can be used to locate records in a database that are related to a trade name, comprising the steps of:
 - selecting an XML tag that is associated with the trade name; and
 - creating a metafile that is associated with the first domain tag by:
 - selecting a first XML tag that is associated with an authorized dealer of a product associated with the trade name;
 - selecting a second XML tag that is associated with an authorized service provider for the product;
 - selecting a third XML tag that is associated with an authorized parts provider for the product,
- so that the metafile can be used to locate records in the database that are related to the trade name.
- **26**. The method of claim **25**, further comprising the steps of:
- in response to a request for information about authorized service providers of the product associated with the trade name, identifying the XML tag using the trade name;
- identifying the metafile using the XML tag;
- identifying the second XML tag using the metafile;
- creating a key using the XML tag and the second XML tag;

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- using the key to search for records including the XML tag and the second XML tag.
- 27. A method for locating records related to a trade name, comprising the steps of:
 - receiving a request for information that includes the trade name:
 - identifying a first tag that is associated with the trade name;
 - identifying a metafile that is associated with the trade name;
 - determining whether the metafile identifies additional tags that are associated with the trade name;
 - if the metafile identifies additional tags that are associated with the trade name, then conducting a query to determine which of the additional tags are relevant to the request;

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- if the query determines that a second tag is relevant to the request, then combining the first tag and the second tag to create a key;
- using the key to search a database to locate records that include the first tag and the second tag.
- 28. The method of claim 27, comprising the steps of:
- if the query determines that none of the additional tags are relevant to the request, then using the first tag as the kev: and
- using the key to search the database to locate records that include the first tag.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,510,434 B1 Page 1 of 1

APPLICATION NO. : 09/474644 DATED : January 21, 2003

INVENTOR(S) : Charles D. Anderson et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In col. 1, line 18, replace "5,952,946" with --6,295,526--.

Signed and Sealed this Sixth Day of November, 2012

David J. Kappos

Director of the United States Patent and Trademark Office

Case: 16-1128 Document: 27 Page: 217 Filed: 01/27/2016

United States Court of Appeals for the Federal Circuit

Intellectual Ventures I LLC v. Erie Indemnity Company, 2016-1128, -1129, -1132

CERTIFICATE OF SERVICE

I, Christian John Hurt, being duly sworn according to law and being over the age of 18, upon my oath depose and say that:

On **January 27, 2016** I caused the foregoing **BRIEF OF THE APPELLANTS** to be filed with the Clerk of Court using the CM/ECF System, which will serve via e-mail notice of such filing to all counsel registered as CM/ECF users, including any of the following:

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Upon acceptance by the Court of the e-filed document, six paper copies will be filed with the Court within the time provided in the Court's rules.

January 27, 2016

/s/ Christian John Hurt
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CERTIFICATE OF COMPLIANCE

1. This brief complies with the type-volume limitation of Federal Rule of

Appellate Procedure 32(a)(7)(B), because it contains 13,994, excluding the parts

of the brief exempted by Federal Rule of Appellate Procedure 32(a)(7)(B)(iii) and

Federal Circuit Rule 32(b).

2. This brief complies with the typeface requirements of Federal Rule of

Appellate Procedure 32(a)(5) and the type style requirements of Federal Rule of

Appellate Procedure 32(a)(6), because it has been prepared in a proportionally

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Date: January 27, 2016

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